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THE PRACTICAL HOME AND SCHOOL EDUCATOR

CONTAINING COURSES OF READING AND STUDY

WITH OUTLINES AND QUESTIONS

ARRANGED TO ACCOMPANY

THE NEW PRACTICAL REFERENCE LIBRARY

AN INVALUABLE AID TO THE STUDENT

VOLUME VI

CHICAGO
THE DIXON-HANSON COMPANY
1910

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The Mother's Creed

BELIEVE, with the gardener, that the youngest plants should have the tenderest care; that the habits of early youth should be so moulded as to develop fixed traits of good character in the adult.

I believe what one wills to be, one can be; "that education lays the foundation, but that self-education erects the building;" that the mind can only possess that which it does.

I believe that obstacles and reverses are but quality-testing stepping-stones to success; that the room for improvement is the largest room in the world.

I believe that within the breast of every child is an instinctive desire to be good; to grow; to learn; to work; to love; to achieve.

I believe in home encouragement; that a home without good, useful books is like a home without windows; that where children are there should be found the treasure thoughts of the greatest men and women of all ages which ever beckon on and on, inspiring to higher ideals and nobler ambitions.

I believe that the mind can only be rightly formed when it is rightly informed; that opportunity ever knocks at the door of those who are rightly equipped to fight life's battles; that the power to think grows by exercise.

I believe in the pleasure of self-sacrifice, the price paid by hundreds of mothers of world-renowned men.

I believe in the education that stimulates thought; develops self-reliance and leads to a delight in whatever is fair in nature, in whatever is true and beautiful in literature and art.

—J. H. H.

The Teacher's Creed

BELIEVE in boys and girls, the men and woman of a great to-morrow; that whatsoever the boy soweth the man shall reap.

I believe in the curse of ignorance; in the efficacy of schools; in the dignity of teaching; and in the joy of serving others.

I believe in wisdom as revealed in human lives as well as in the pages of the printed book; in lessons taught, not so much by precept as by example; in ability to work with the hands as well as to think with the head; in everything that makes life large and lovely.

I believe in beauty in the schoolroom, in the home, in daily life and out of doors.

I believe in laughter; in love; in faith; in all ideals and distant hopes that lure us on.

I believe that every hour of every day we receive a just reward for all we are and all we do.

I believe in the present and its opportunities; in the future and its promises; and in the divine joy of living.

—Edwin Osgood Grover.

He that loveth a book will never want a faithful friend, a wholesome counselor, a cheerful companion, and an efficient comforter.

THE PRACTICAL HOME AND SCHOOL EDUCATOR

Its Object and Use

A noted educator has said that a student is half made as soon as he seeks knowledge for its own sake. In The Practical Home and School Educator the departments of knowledge treated in The New Practical Reference Library are outlined and so arranged as to show the logical relations of the articles pertaining to each department. Experience has shown that a work of ready reference is most convenient to the general reader when the articles are arranged in alphabetical order; but this arrangement often disconnects topics which are closely related, and a supplementary volume, in which the leading departments of the work are outlined, is of inestimable value to those who wish to pursue any department of knowledge systematically. To the ambitious student, to the business man, and to the teacher the Educator makes The New Practical Reference Library a home university of practical knowledge in which any subject of importance can be systematically studied.

The Educator aims to create a desire for knowledge for its own sake, and also to awaken a deeper interest in those subjects which are closely related to the interests of its various readers. It will arouse interest, systematize study, stimulate a love for knowledge-seeking, strengthen self-reliance, broaden one's views of life, and add to the storehouse of useful and necessary information on the part of every student, young or old.

The Outlines

The outlines have been carefully prepared and enable the teacher and pupil to pursue the subjects to which they belong in a systematic and thorough manner. The Educator contains model outlines on practically every department of knowledge, and these are so arranged as to make them valuable in all grades of school work. These outlines furnish the ambitious teacher an abundance of suggestive material for the pursuit of any line of study during idle hours, and they also permit successful review work. From these outlines the teacher will find it an easy and pleasant task to so arrange and present her subjects as greatly to increase the interest of her pupils in their work.

A course of study is in use in all public schools, and the teachers of all departments and all grades are expected to conform to this course in their instruction. In the preparation of the Educator the editors have made frequent reference to and use of some of the best courses of study in the country, and the work in this volume is so arranged as to conform to the needs of teachers and pupils in the public schools.

It will be noticed that all the main divisions of each outline will be found treated in The New Practical Reference Library. For illustration: In the outline on Agriculture there are many subdivisions, such as *Soils, Plants*, etc., each of which is fully and interestingly treated in its turn and can be outlined. The reader is also constantly referred to lists of correlated subjects, permitting him to extend his study and research.

The Questions

The feature that will appeal to parents and teachers alike is the list of interesting questions which follow the outlines. The importance of being able to put her questions in good form is appreciated by every teacher and mother, and the questions in the Educator furnish excellent models for study. These questions also afford the student, young or old, a wide field for pleasant and profitable study. It must be apparent to every parent and teacher that by the use of this feature in connection with The New Practical Reference Library many an otherwise long, rainy day or winter evening can be devoted to excellent use. Home study clubs can be organized. Father and mother will find an hour spent with the children in such study invaluable to themselves. The habit acquired of devoting a few minutes each day in this manner must recommend itself to all who value time and know what it means to be well-informed.

It will be noticed that many of the questions relate to the boy's immediate surroundings—the home, the playground, the neighborhood, his city and county. This leads to a keener observation, greater alertness, and increases the interest. For home study work begin with subjects relating to the breakfast table, such as *Coffee, Sugar, Salt, Orange, Tea, Etc.*, and note the immediate interest aroused and what an earnest effort is made to procure the information called for. Many of the questions will arouse one's curiosity; curiosity will in turn arouse one's interest, and interest leads to investigation and study.

In looking up the information sought from these questions in The New Practical Reference Library, the student should turn to the subject most directly alluded to in the question. Ninety-nine per cent of the questions are based on information found in the Library. Their value lies in the fact that they must be looked up. This soon develops the habit of research which leads to a love for knowledge. Once acquired this habit becomes a fixture for life. A few questions are asked throughout the Educator that cause one to resort to pencil and paper for solution, such as "How many Rhode Islands can be carved from Texas?" "What would be the population of California if as thickly settled as Massachusetts?" In each case the information needed as a basis for solution will be found in the subject referred to and should be looked up.

Leading Departments

The following departments are fully treated in the EDUCATOR; the outlines and questions given under each are suggestive, and should lead the teacher and pupil to prepare similar work on other subjects.

AGRICULTURE

The Department of Agriculture is designed to develop a love for rural life, and show the boys and girls the possibilities of this most important occupation. The old idea that anyone can be a farmer is fast disappearing. Successful agriculture now depends upon scientific methods, and those who would make it a life occupation must master the sciences and arts directly connected with it.

ARITHMETIC

Arithmetic is conceded to be one of the most necessary and practical branches taught in the schools. The subject is treated in the EDUCATOR in a very plain, thorough and practical manner. All unnecessary topics are eliminated and the treatment is confined to the fundamental operations and such principles and rules depending upon them as are in general use in business.

LANGUAGE

A correct use of English is essential to success in business and to one's ease and enjoyment in society. When a child has become thoroughly proficient in this subject he will use correct English from habit. The formation of this habit is one of the most important duties of the school. The many exercises which have been given, and the excellent editorial work devoted to THE NEW PRACTICAL REFERENCE LIBRARY are helpful in equipping one in this subject.

ORTHOGRAPHY

"Nothing in written composition makes so unfavorable an impression or is so inexcusable as bad spelling." Correct spelling is an accomplishment which can be acquired by any student, but it must be gained while young and by special application. Very helpful exercises are given in this subjejct.

LITERATURE

In the EDUCATOR we give comprehensive outlines on English and American literature, on the drama and on Shakespeare, and also supply many choice selections for memorizing. The model outlines will serve you in developing any department of this subject from the information found in THE NEW PRACTICAL REFERENCE LIBRARY.

READING

Reading being the basis of all study, we have endeavored to supply material that will create an interest in this subject, and by following out the suggestions the pupil will acquire the ability to read intelligently not only his text-books but periodicals and other books necessary for his education.

Geography

All work in Geography begins with the home. We have given exhaustive outlines on the school district, township and county, and we have taken up various states, provinces and cities, not only giving outlines but also supplying in The New Practical Reference Library the necessary information and illustrations for a thorough study of these subjects.

Sciences

The various branches of natural science are fully and adequately treated in The New Practical Reference Library, and outlines on the most important, such as *Physics, Physiology, Astronomy* and other sciences are given in the Educator.

History

No other work is so unique as the Educator in the presentation of the subject of History. The pen sketches and colored charts here supplied enable many pupils to become familiar with the history of the world, and with our own country, with far less effort than they usually have to expend to gain a knowledge of this subject. Special emphasis is laid upon the civil side of history, and the importance those movements which have led to progress in civilization is clearly brought out.

Drawing

Drawing is universally required in courses of study for the public schools, but unfortunately there are but few helps in this important subject within reach of the teacher. The work in Drawing in the Educator was prepared by Mr. D. R. Augsburg, author of Augsburg's Drawing, one of the most practical and widely used courses of drawing in the United States. The work is strong, clear and practical and will be especially helpful to the teacher of this subject.

Physical Culture

The indoor life followed by a large number of our people renders attention to health and the development of the body absolutely essential in the public schools. To assist teachers and pupils in this matter we have prepared and introduced a course of study with illustrative exercises which will be found practical and helpful.

Ethics

The demand for moral training in the public schools is becoming stronger each year. The question as to what is right, and the question how and where may the knowledge of right be obtained, are always pressing to the front in every school and home. An outline on the important subject of ethics will be found of great value in enabling both teacher and pupil to settle some of these questions.

Other Subjects

We have merely called attention to a few of the many essential subjects which enter into a practical education. In addition to the subjects mentioned above, you will find careful treatment of many others such as Handiwork, Music, Mythology, Religion, Politics, Business, etc. Every student knows how important it is to have an abundance of supplementary material outside of the regular text, and how much labor it costs to collect it. This Library will thus relieve the overworked teacher and inspire the ambitious student, enabling them to do more effective work at a smaller outlay of effort.

To the Ambitious Young Man and Woman

There are sixty million people in the United States out of school. Whatever the school may do for the individual, it has fallen far short of its real purpose with that man or woman who leaves its doors without an ambition to continue his studies by himself.

"Education," says Bishop Spalding, "lays the foundation; self-education erects the building." No one is so great in business or so skilled in the arts or professions that he can afford to neglect self-improvement. Not to grow is to retrograde.

Life is a battle. The victors are those who not only advance to meet their opportunity but who daily add a fresh fund of practical knowledge, knowing that knowledge is not only power but property.

"Most people unconsciously waste time enough for self-education, and in many instances the time is wasted because when the leisure fifteen minutes come they have nothing at hand on which they can spend that quarter of an hour."

The ambitious young man or woman denied the advantages of a broad education, or desirous of adding to his fund of useful information, will find THE NEW PRACTICAL REFERENCE LIBRARY and THE PRACTICAL HOME AND SCHOOL EDUCATOR a veritable university placed at his disposal.

With the helpful stimulus and the effective, intelligent plan and study furnished by the EDUCATOR, a field of study is opened as wide as human knowledge and achievement. The best thoughts of all ages, the wisdom gathered from a thousand geniuses, are placed at his disposal.

An hour a day devoted systematically to study will make an ignorant man well educated in the course of two years. It will give him a capital on which he will draw dividends and interest throughout life.

Today, more than ever before, it is the man who knows, the man who is broadly and correctly informed, the man who is ready to grasp the opportunities as they come, who succeeds. Self help is at the basis of all achievement.

"Industry is one really great thing you will need. If you want the highest positions, you must pay the price. This world runs a one-price store and has no bargain-counter. Don't expect the goods unless you pay the price." That price may be hours spent in study which would otherwise be given to pleasure, but the result will be worth all it costs. The late President Harper of the University of Chicago said that if one would give one hour to study each day one could learn a new language every year.

To The Teacher

Learning is the chief activity of the school. Teaching is closely allied to learning.

To learn is to gain knowledge of a subject or skill in an art or occupation. To teach is to guide one in learning.

The teacher must recognize a duality of existence—the mind and its environment, or the mind and the world. It is the teacher's part to help the child to possess the world.

Interest is the key to all successful study. A school without interest is the burying place of many ambitions. In such a school are killed the impulses to grow, to study, to observe, to know, and to achieve. Such a school is in the hands of a non-progressive teacher. Either from lack of material or lack of inclination, the non-progressive teacher invariably follows a narrow, beaten pathway lined with the lifeless pages of text-books.

The true teacher must feel that she is educating herself as well as her pupils. She must enter into the work with enthusiasm and earnestness, and kindle in the heart of every pupil a love for study.

The teacher should endeavor to add to every well-known fact some new material, thus stimulating pupils to think, to investigate and to observe. The teacher who follows this plan gradually leads the pupil, by developing his mental powers, to educate himself.

To the progressive teacher THE PRACTICAL HOME AND SCHOOL EDUCATOR and THE NEW PRACTICAL REFERENCE LIBRARY cannot fail to appeal. In these volumes, which are the product of the leading educators of the country, the teacher will find helpful supplementary material, timely suggestions and an inexhaustible field for self-improvement. The excellent outlines and carefully prepared questions will prove valuable stimuli for the pupils' study. By their use subjects can be assigned to be looked up, and every recitation can be made bright and interesting by the addition of new material.

Thousands of questions, covering all grades of school work, can be used by the progressive teacher to awaken the liveliest interest on the part of both pupils and parents. When interest is aroused it is not difficult to secure good results. When interest is lacking, success is lacking. You cannot teach when the mind is asleep. Promotion always follows preparation. Teachers do not secure better positions because of luck or pull but because of the good results caused by ceaseless effort.

The use of THE PRACTICAL HOME AND SCHOOL EDUCATOR and THE NEW PRACTICAL REFERENCE LIBRARY will enable teachers better to systematize their work, to save their energy, to economize their time, to make every lesson more interesting, and every day's work more effective.

To Parents

Every parent wants his children to become noble men and women. He wants them to succeed in their life work and to be a blessing to others. Parents feel the weight of responsibility resting upon them in leading their children to yield to right influences, to form good habits, and to develop noble characters.

As is the home, so is the child. Surrounded with good influences and treated with kindness, the child lives a happy life and develops his power of mind and body along desirable lines. Parents should recognize the fact that a healthy body is essential to a healthy mind, and should see that means are provided for training the body as well as the mind. The EDUCATOR and THE NEW PRACTICAL REFERENCE LIBRARY give many suggestions helpful to parents in training their children. Since Physical Culture is treated elsewhere in this volume, we confine the following pages to suggestions which apply especially to training the mind.

You have wondered why some boys take such delight in their school work, while others manifest so little interest in it. Let us visit the homes of two boys belonging to these respective classes.

THE INTERESTED BOY. In the home of the interested boy we find a boy with an active and inquisitive mind. He asks scores of questions, some being the result of his day's work at school, some prompted by his father's and mother's discussion or reading, others the result of his observations in the home or on his way to and from school, and still others have arisen because of his own thinking and discussions with his playfellows. We admire his interest and alertness. We realize that he has begun right, and with a little direction will continue right. Instinctively we think of the successful professional and business men whom we have known as having been just such boys, retaining all these years the habits and traits of early boyhood. Inquiry reveals the fact that this boy has been blessed with teachers who helped him most by leading him to help himself. They have stimulated him to observe and investigate subjects and questions, and to think—in short, to do for himself. We also learn what is far more important—that this boy is constantly encouraged along his lines of study by an interested father and mother, who are never too busy to answer his questions, and who provide him with the means for self help and improvement.

THE DISINTERESTED BOY. In the second home we find a boy who manifests no interest in his school work or studies. He does not observe; he does not ask questions; he does not think or reason. He has a mind, but does not hunger for knowledge; he prefers idleness to activity; in short, he seems to be asleep rather than wide awake. Again we call to mind the many idlers and no-accounts, the shiftless and dependent whom we have known, and in imagination we see them in their boyhood in the same condition as the boy before us. Inquiry reveals the fact that this boy's teachers have stimulated him to think, to observe and to do for himself, but that he fails to respond because his first efforts along this line have met with no encouragement from father or mother, who feel that their

whole duty is done when he is sent off to school, forgetting that he needs their help, their encouragement, and, above all, their interest in his work.

Again, father and mother cannot help him because they do not understand his work, or are too busy to give it their time. He finds no helpful working tools on his study table. The question that he was assigned to look up yesterday he cannot answer on his return to school today. After numerous failures he feels that the odds against him are too great, the humiliation too much, and he becomes discouraged. Soon he loses all heart and interest in his work, and simply drifts. The teacher's best efforts will fail unless they are seconded by home influence.

The Practical Home and School Educator has been prepared to enable parents and teachers of the first boy to hold and develop his interest; to enable the parents and teachers of the second boy to encourage and awaken and stimulate in him a desire to learn and achieve. It furnishes a field of natural research and delightful study, broader than that given in any college or university.

In the preparation of The New Practical Reference Library, the educators have aimed to give information in simple, concise, and interesting manner on practically every subject that will come up in connection with a boy's entire school life, and, best of all, to give it in such a way that he can find it by himself and for himself. Intelligent parents and teachers have long felt the need of such a work.

The thousands of questions and helpful outlines cannot fail to interest every one. A studied effort has been made to ask such questions as will lead to observation and investigation in the boy's own home and immediate neighborhood. Parents using the Educator in connection with The New Practical Reference Library will find much of help and interest to themselves. We never grow too old to learn. No one is too old or too young, too wise or too ignorant, to gain good from its pages. After all, the habit, early acquired, of looking up subjects as they come to one's mind, is the most valuable part of any boy's or girl's education. With this habit securely fixed, schoolhouses and teachers could be dispensed with and yet the education would go on and on as did Lincoln's.

The progress of events makes a broader equipment necessary to success in the present than in former years. The equipment that was sufficient for a boy twenty-five or even ten or five years ago, is not sufficient today. The world is nearer to us; life is more complex, more full of meaning, and to succeed requires a better trained mind than was necessary in the days of our fathers. Some parents are so engrossed in the accumulation of property or the prosecution of business that they give little attention to the educational needs of their children. Such should bear in mind that "To make a life is more than to make a living."

New occasions teach new duties; Time makes ancient good uncouth;
They must upward still, and onward, who would keep abreast of Truth.

How to Study

Your education consists of two parts—what you learn by yourself and what you learn from others. Both parts are valuable, but with most people the second is by far the more extensive. What we learn from others is obtained very largely through the reading and studying of books.

When a person has learned *how* to study, he has obtained the best part of his education, for he has acquired the power which will enable him to master any subject, provided he possesses the necessary patience and perseverance.

Definitions. *Study.* Study is the systematic application of the mind for the purpose of gaining knowledge, especially for gaining knowledge from books.

Interest. Interest is the satisfaction that one derives from the study of a subject, or the appeal which the subject makes to one.

Principles. The following principles for study are given in the hope that they may save some waste of effort, and that they may be found generally helpful.

(1) Study Requires Attention. One cannot gain knowledge through reading unless one's mind is fixed upon the subject studied. Moreover, the mind must be active, alert, reaching out to grasp the subject pursued. A boy cannot solve a problem in arithmetic while thinking about a game of marbles, nor can a girl learn a lesson in history while her mind is upon a party she expects to attend in the evening.

(2) Interest is the Key of Attention. We naturally devote our minds to those subjects which satisfy us. Therefore the boy thinks of the game of marbles instead of his problem, and the girl gives her attention to the coming party instead of the history lesson. Were the arithmetic and the history made as attractive as the marbles and the party, the attention would be given to them as readily.

(3) Understanding is Necessary to Interest. A subject which we do not understand does not appeal to us. All subjects should be so presented to children that they can understand them. The language should be simple, and the thought and the illustration should be clear. When parents and teachers present subjects to children in this way, they will have little trouble in securing interest in them. Care should be taken that the meaning of all words used be understood, and that all reference to related subjects be cleared up. This means that children should be taught as early as possible the use of works of reference.

Rules for Study. Many people arrive at the age of maturity without knowing how to study. The following rules will be found valuable in enabling them to acquire a method which will result in the best use of their mental powers.

(1) *Study to Remember.* Memory links the past with the present. It is that mental power which enables us to join the lesson of yesterday to that of today. It develops early in life and should receive careful attention, but we

should be sure that we understand what we memorize, and parents and teachers should be certain that children understand what they memorize. Unless this precaution is taken, they will commit to memory words that have no meaning.

(2) *Study Principles Rather than Rules.* When you comprehend the principles of a subject in their relation to each other and their relation to other subjects, the rules will take care of themselves. In fact, your best rules will be those which you deduce from your study. Rules are based upon principles, and unless the principles are understood the rules are of little value.

(3) *Think as You Study.* In other words, study subjects in their relation to each other. To illustrate: Note the vital connection between history and geography, between literature and all of the sciences, and trace these connections to the fullest possible extent. It is only in this way that the full significance of any subject can be understood.

(4) *Study Systematically.* This you are bound to do if you trace the relations which the various departments of a subject bear to each other. The systematic arrangement of a subject under divisions and sub-divisions assists in the understanding of the subject and also aids the memory. Suppose you wish to learn about coal: You will wish to know of coal (1) what it is; (2) how it is formed; (3) the different kinds or varieties of coal; (4) where coal is found; (5) the leading countries in its production; (6) its principal uses; (7) how long it has been used, and when it was discovered in the United States. This outline gives an idea of the kind of plan that should be followed in studying the subject. It also shows how the leading articles in THE NEW PRACTICAL REFERENCE LIBRARY are arranged.

(5) *Make a Wise Use of Reference Books.* No one treatise contains all of the information to be obtained on one subject. Neither does it point out all of the vital relations of this subject to others. Therefore one who wishes to study broadly needs to have at hand other works. Among the most valuable of these is an encylopedia which contains the leading facts in the subjects presented. The use of such a work broadens one's study, saves time, and leads to a fuller comprehension of the subject than is otherwise possible. Collateral works on the same subject are also of value.

(6) *Study with Energy.* When you study put your best effort into the work. Never allow yourself more time than is necessary to accomplish a task. Many people permanently injure their capacity for mental work by requiring listless habits of study.

(7) *Study to Apply Your Knowledge.* The only test of knowledge is ability to use it. A boy may commit to memory all of the rules in the arithmetic, but if he cannot reckon interest on a note he does not know the rule for finding interest, however glibly he may repeat it.

Books contain the stored-up wisdom of the past; through them we learn of the experiences, the successes and failures of previous generations, and profit by these experiences.

The spirit of self help is the root of all genuine growth in the individual. The opportunities for study which the quiet of the home offers are unequaled. The way the leisure hours at home have been used has determined the success or failure of legions of men and women. How do you spend your leisure hours?

The men who are considered great genuises and who have moved the world have been able to accomplish things because they were able to attend to subjects longer and more systematically than their companions.

The true university of these days is a collection of books.

—*Carlyle.*

Agriculture

Agriculture is the oldest of occupations and the basis of all other arts. All wealth comes originally from the soil and thus the farmer becomes the backbone of civilization.

The great demand for American agricultural products by the nations of Europe has led to wonderful development in every department, and to the intelligent farmer who knows how to produce the best results without exhaustive labor, farm life is the healthiest and most invigorating in the world.

The New Practical Reference Library is rich in information along every line of agricultural development. The general outline, followed by the outlines and questions on Irrigation, Corn, Milk, Forestry, etc., are merely suggestive of the treatment of the hundreds of undeveloped subjects.

OUTLINE.

I. Early History.

II. Progress.

III. Agricultural Machinery.

IV. Division of Labor.
   1. Dairying.
   2. Stock Raising.
   3. Horticulture.
   4. Cereal Crops.

V. Education.
   1. Agricultural College.
      a. Who first recommended?
      b. When first established?
      c. What grants and appropriations?
      d. How universal now?
      e. What kindred subjects?
      f. How locally adapted?
   2. Agricultural Experiment Stations.
      a. Origin.
      b. Location.

c. Number.
d. Work.
Experiment with fertilizers.
Experiment with soils.
Improve varieties of grain.
Improve varieties of fruit.
Improve breeds of live stock.
To study habits of noxious insects and devise means of destroying them.
To study diseases of domestic animals, and to provide means for their prevention and cure.
e. Specialize.
f. Bulletins.
g. Results.

3. Department of Agriculture.
a. Organization.
b. Branches.
Archives.
Patents.
Causes and statistics.
Public health.
Health of animals and live stock.
Experimental farms.
Dairy and cold storage.
Seed.
Exhibitions.
c. Lines of investigation.

VI. Soil.

1. Agencies in Formation.
a. Atmosphere.
b. Sunlight.
c. Water.
d. Plants.
e. Animals.
2 Composition.
3. Kinds.
a. Alluvium.
b. Sandy.
c. Clayey.
d. Lime.
e. Peaty.
f. Loam-humus.
4. Fertilizers.
a. Natural.
Manures.
b. Commercial.
Fertilizer.
Guano.
Menhaden.

VII. Plants.—Seeds.

1. Development.
2. Roots.
a. Function.
3. Stems.
a. Function.
4. Leaves.
a. Function.
5. Fruit.
6. Germination.
7. Fertilization—pollen.
8. Uses.
a. Purify air.
b. Loosen earth.
c. Fertilize soil.
d. Serves as food.
9. Enemies and Diseases.
a. Fungi.
b. Smut.
c. Insects.

VIII. Correlated Subjects:

Agrarian Law.
Agriculture.
Agricultural Colleges.
Agricultural Experiment Stations.
Animals.
Ant.
Atmosphere.
Banking.
Barometer.
Bean.
Bee.
Beet-Sugar.
Birds.
Botany.
Bread.
Breeds.
Building.
Butter.
Cattle.
Climate.
Cheese.
Clover.
Coal.
Commerce.
Dairy.
Distillation.
Dog.
Education.
Emigration.
Ensilage.
Farmers' Institutes.
Fish Culture.
Flax.
Floriculture.
Flour.
Forests.
Fruit.
Fungicides.
Grasses.
Granges.
Guano.
Grasshopper.
Horticulture.
Harvesting.
Heating.
Honey.
Hops.
Horse.
Hunting.
Insects.
Insurance.
Jute.
Land.
Lease.
Law.
Maize.
Manure.
Mensuration.
Oats.
Oils.
Parasites.
Potatoes.
Poultry.
Pumpkins.
Rent.
Salts.
Sequoia.
Sewage.
Sheep.
Sugar.
Swine.
Threshing Machinery.
Tobacco.

QUESTIONS ON AGRICULTURE.

How many things can you name on your table dependent on the farmer—remembering that milk, cream, meats of all kinds, flour, and all vegetables are his products?

If your field of wheat is attacked by rust or chinch bugs what crop should follow to destroy the pest?

To what extent is the National Government interested in farmers?

Why are farmers considered the backbone of a nation?

Give a number of inventions in farm machinery and results of their use?

Does agriculture now rank as a science?

Where will the influence of scientific farming be felt first, on the small or the large farm? Why?

Are individual farms becoming smaller? Why?

Can scientific methods on small farms balance the loss in acres?

What is the average size of English farms? Of farms in the United States? Of farms in Canada?

What is the demand abroad for our agricultural products?

What are the chief agricultural products of Europe?

Name our agricultural exports and imports.

Why did the government become interested along this line?

What are they doing along the line of reclaiming arid districts in the United States and Canada by irrigation?

What are experiment stations. What are the direct benefits to the farmer?

Who were the foremost people in agriculture in ancient times? Tell of their methods and knowledge.

Growing crops are subject to what dangers in general?

What particular blight threatens each of the following: Cotton? Oats? Corn? Wheat? Hay?

What is the government doing to aid irrigation?

At what date did the National Government take up the subject of agriculture?

What do we mean by the term "specializing" in farming?

What are the benefits of specializing in farm work?

Are most of the farmers what we may term "general farmers"?

Why is progress along scientific lines in farming of slow growth?

What is the value of the rotation of crops? Give some of the beneficial results obtained?

Of what interest and value are farmers' institutes?

What are the chief ingredients of fertilizers brought from the slaughtering houses?

What references are made to the grain and corn products of Egypt in the Old Testament?

Agriculture is the basis of all other arts. Why?

In a bushel of oats weighing forty pounds how many pounds would constitute the meal?

What is winter wheat? Spring wheat? What is the annual production in this country?

Were potatoes known in Europe before the discovery of America?

What is the chief importance and value of beets?

Name some of the materials found in your home dependent on flax. How does flax enter into the painting of your home?

In what American countries is tea successfully raised? Rice?

Where is tobacco raised? What is the height of the plant? What part of it is used?

What remarkable improvement in the tobacco plant has Burbank brought about?

If you should visit the farmers of Oregon, what crops would you find in their fields?

What would you find to be the principal crop on the Kansas farm? On the one in Michigan? In Pennsylvania? In Kentucky? In Virginia? In Manitoba? In Ontario? In Nova Scotia?

Of what great value to the agriculturist and horticulturist are some of Burbank's wonderful discoveries and experiments?

How many sheep are slaughtered in the United States yearly?

Irrigation

I. Definition and Purposes.

II. Ancient.

1. Egypt—China—India.

2. United States—Mexico.
   a. Indians.
   b. Spanish missionaries.
   c. Miners turned attention to agriculture.
   d. Mormons.

III. Modern.
1. Egypt.
a. Dams across the Nile increased irrigable area how many million acres?
2. United States.
a. What acreage reclaimed in west and southwest?
3. Other sections of world.
a. Acreage reclaimed in Canada.

IV. Necessities of Irrigation.
1. When annual rainfall is less than what amount?
2. When rainfall is distributed how?
3. For crops requiring what?

V. Methods and Aims.
1. Preserving rainfall where?
2. Saving of waste water, where and how?
3. Distribution of water to what districts?

VI. Statistics.
1. Size of farms.
2. Amount of water used.
3. Engineering feats.
a. Tunnels.
b. Reservoirs, etc.

VII. Government Aid.
1. Irrigation laws.
2. Work accomplished.
3. Work projected.

QUESTIONS.

Why is it necessary for government to carry on the work in irrigation?

What important law has been passed relating to irrigation and what are its provisions?

What are some of the feats in engineering necessary in this work?

What parts of the United States are being reclaimed?

Locate some of the largest reservoirs and dams in the United States and Canada.

In what foreign countries did irrigation originate?

How long are the dams across the Nile? For what are these dams used?

Who first practiced irrigation in the United States?

What is the outcome of irrigation in the Mormon settlements in Utah?

When is irrigation necessary?

What are the three lines of work in this industry?

What is the average size of an irrigated farm in the United States? In Utah? In California? In Canada?

INTERESTING FACTS ON IRRIGATION.

Since the reclamation law of the United States was enacted by congress in 1902, eight towns have been built and 10,000 people have settled on what were desert lands. Over 5,500,000 acres of land have been brought under cultivation. One hundred miles of branch railways have been built, 1267 miles of canals have been dug, many of which carry whole rivers, and forty-seven tunnels have been excavated—one, that for the Uncompahgre Valley, being six miles long. It is estimated that the territory embraced in what is known as the arid regions of the United States covers 600,000,000 acres, of which about 60,000,000 acres are subject to irrigation and can be converted into farms fully as productive as lands in the most favored sections.

Refer to illustration on irrigation and tell of some of the results you see.
What is the income per acre of irrigated land?
What is the value of irrigated land?
What is the Reclamation Law of the United States?
What are the irrigation laws of Canada?
For how many families will this provide homes?
What will be the expense of the government to irrigate this land?
From what great distances is water sometimes brought?
In what localities is irrigation dependent upon artesian wells? What are the methods?
What are flumes?
How fast has the irrigation of arid regions of the United States increased in the last ten years?

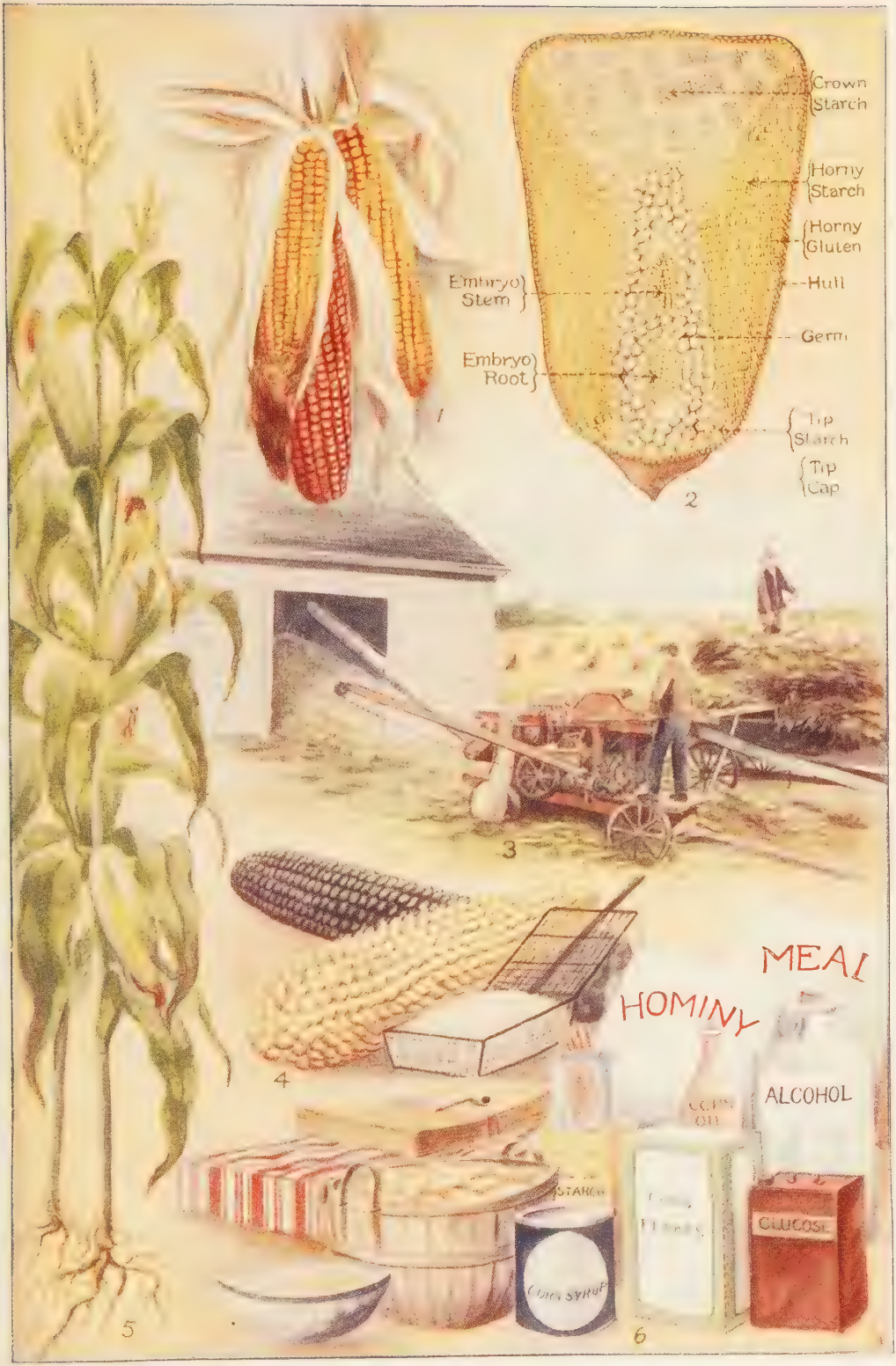
Corn

I. General Description.
   1. Stalk.
      a. Height.
      b. Jointed.
      c. Color.
      d. Structure.
   2. Leaves.
      a. Shape.
      b. Length.
      c. Position.
   3. Flowers.
      a. Silk.
      b. Tassel.
      c. Location on stalk, where?
      d. Location on ear, where?
   4. Fruit—Ears.
      a. Arrangement of kernels, and number on cob.
      b. Covering. What?
      c. Location on stalk.

II. History.
   1. Corn was first used and cultivated where and by whom?
   2. Use by whites dates from what time?
   3. Cultivation by other nations.

III. Kinds.
   1. Flint.
      Where cultivated.
   2. Dent.
      a. The corn of commerce.
   3. Sweet Corn. Canning industry.
   4. Pop Corn. Commercial uses.

IV. Planting, Cultivation, Harvest.
   1. Planted how? Machinery used?
   2. Cultivated or plowed, how long? Machinery used?
   3. Harvested. When? Where placed?
   4. Fodder. What is it? How cut? How used?



CORN

1, Cluster of Ears.
2, Detail of Kernel.
3, Husker and Shredder.
4, Popcorn.
5, Corn Plant.
6, Corn Products.

V. Where Cultivated.
1. United States.
a. What per cent of world's supply?
b. Annual yield in bushels?
c. Valued at what?
d. Importance as an industry?
e. Income exceeding what two crops combined in the United States?
2. Other Countries.
a. Russia.
b. Canada.
c. Argentina, etc.

VI. Products.
1. Food. Importance in world as food.
a. Mankind.
Meal.
Hominy.
Hull corn.
b. Animals.
Whole corn and preparations for all live stock.
2. Miscellaneous.
a. Starch.
b. Glucose.
c. Alcoholic liquors.
3. Cobs.
a. Syrup.
b. Fuel.
4. Husks. Stalks.

VII. Markets.
1. Local.
2. World.
3. Board of Trade.

QUESTIONS.

Why called Indian corn?

How many dishes are made from corn meal in your home?

Start with the farmer and name the industries that arise or are dependent upon corn.

To what family of plants does corn belong?

How does corn rank as a food throughout the world?

INTERESTING FACTS ABOUT CORN.

Prof. Wiley of the U. S. Department of Agriculture says that since every hundred pounds of cornstalks will yield six and a half pounds of absolute alcohol, it is obvious that the agriculturist has been allowing an enormous amount of wealth to go to waste.

Say that one acre will yield from ten to twelve tons of grain stalks, or about 20,000 pounds, and you have a quantity of raw material which will produce 1,300 pounds of absolute alcohol, or 216 gallons. Alcohol at the present time is worth 40 cents a gallon.

Ground in a wet condition and dried, cornstalks may be kept indefinitely and are ready at any time for conversion into alcohol. Prof. Wiley says that the alcohol derivable from the cornstalks that now go to waste in this country would not only drive all the machinery of our factories but would furnish the requisite power for all our railroads and steamboats, run all of our automobiles, heat and illuminate all our houses and light the streets of every city in the Union.

What does corn contain that makes it valuable as a food?

In general appearance what plant does it resemble?

How many kinds of flowers has the plant? Which flower forms the tassel? Which the silk? What is at the inner end of each thread of silk?

Do the ears have an odd or even number of rows? How are they covered? Why?

Of what continent is corn a native? What is known of its use among the Aztecs and Incas? How far north is corn now cultivated?

What is the difference between the corn belt in the cool temperate regions and that of the warmer corn belt?

How does corn compare in value with wheat?

What is the average price of corn per bushel? What is the average yield per acre? What is the value of a crop on 40 acres of land yielding 65 bushels per acre?

What are the results of a failure in the corn crops of the United States?

Follow the corn from the field until it is returned to you as corn meal. As cornstarch. As syrup.

Describe flint corn. What are the two chief varieties of flint corn? Where is the yellow variety generally raised? Where is the dent corn grown? From what does it take its name? How high does it grow?

To what extent does the United States export corn? To what countries? Follow its line of travel from the village warehouse to its destination.

How does sweet corn differ from field corn? What great industry is connected with this article?

Why is corn used as a fattener of stock?

In what manner did the Indians grind corn? How is it cultivated and prepared for food by the native Mexican today?

How is corn planted? Cultivated? Harvested? When does the cultivation begin? Upon what do the methods of harvesting depend? What machines are now in use on the larger corn farms?

What proportion of people use it as a food? Give three forms in which it is commonly used.

Give three manufactured products made from it which are used extensively. From what is corn oil made? For what is it used?

Of what value are the stalks? How is green corn used as fodder? Describe the process in detail. (See ensilage.)

What proportion of the world's product is raised in the United States? Name the three leading corn-producing states.

How many billion bushels are raised annually in the United States? What is the value of the yearly crop?

How does this compare with the production of gold? Silver? Iron? Cotton?

What foreign countries produce large quantities of corn?

Milk

I. Description.—Liquid, odorless, sweet, opaque, etc.

II. Sources.
   1. Cow.
   2. Goats.

III. Composition.
   1. Solids.
   2. In Solution.

a. Water.
b. Caseine.
c. Sugar.
d. Fat.
e. Salt

IV. Uses.
1. Primary.
a. To support offspring of mammals after birth.
2. Secondary.
a. Food. Beverage, cooking, etc.

V. Products.
1. Cream.
2. Butter.
3. Cheese.

VI. Dairies.
1. Breeds of Cattle. Alderneys, Shorthorns, Jerseys, etc.
2. Separators, Butter-Making, etc.

VII. Creameries.
1. Owners.
a. Association of farmers.
b. Stock company.
c. Individuals.
2. Apparatus.
a. Milk and cream testers.
b. Milk tanks. Fresh and skim milk.
c. Cream tanks.
d. Engine.

VIII. Distribution of Milk.
1. Milk trains.
2. Milk wagons.

IX. Products and Exports of Factories.
1. Butter.
2. Cheese.
3. Oleomargarine.
4. Butterine.
5. Condensed milk or cream.

X. Government Inspection.
1. Adulteration.
a. Water.
b. Chalk, etc.

QUESTIONS.

If you could have but one food throughout life, which would you take—milk or meat?

What work is performed by the separator?

What is a creamery? Generally located where?

A MILK-TREE.

There are several species of the milk-tree in South America. That of Brazil is one of the largest trees of the kind. It furnishes a wood much prized for shipbuilding. The tree is tall, with large oval leaves and dark brown bark. It yields a fruit that tastes like that of strawberries and cream. A white milk flows when an incision is made in its trunk. This milk, like that which comes from a cow, can be used in tea and coffee. It will burn easily and gives out a green flame. It belongs to the family of fig-trees. —*Morton.*

What causes milk to sour? Give uses of sour milk. What is whey?

Name the different kinds of cheese. What foreign country is noted for its cheese?

How is milk regarded as a diet? Why should it be drunk slowly?

What makes cream rise to the top?

Why is cheese served with the last course at dinner?

In what ways can milk be adulterated?

Why does headache often follow the drinking of milk?

How is it possible for milk to be the means of spreading disease?

What steps has the government taken in regard to milk inspection?

Name some of the dishes prepared in cooking whose foundation is milk or cream?

Is milk an absorbent? What dangers lie in this fact? What are some of the rules for the taking care of milk?

Correlated subjects: Butter, cheese.

Forestry

I. Definition.

II. Purposes.

1. National government.
   a. Creation and maintenance of forest reserves.
   b. Prevention of forest fires.
   c. Reformation of present methods of lumbering.
   d. Reforesting of denuded areas.
   e. Regulating the cutting of timber on forest reserves.
   f. Forest surveys.
   g. Hydrographic surveys.
   h. Supplying private owners of land with trees for planting.
   i. Sending foresters to lecture in universities and other schools.

III. Methods.

1. Schools established by government in which experts are trained to devote their life to the work of forestry.
2. Experts sent from these schools to lecture, etc.

IV. Uses of Trees.

1. Shade and ornament.
2. Windbreaks of farms.

Note (told by an Indian guide).—It was a pine tree growing in a gulch in Colorado, 8 feet in diameter and over 100 feet high. I had promised to return when this tree was felled and look the giant over. It fell with a crash on one of its huge limbs, splintering it so badly that it was useless as timber.

On making a study of it I found the tree to be 1,047 years old, a ring for every year's growth; quite a tree in the year 1340, over a hundred years before America's discovery.

For the first hundred years of its life it had had a prosperous growth, as rings were fully and largely developed. Then followed two years of poor, thin growth, as indicated by the rings succeeding the thick, regular ones. In the year 1491 a peculiar accident occurred; a tree growing near apparently toppled over upon it, two tips breaking off and being imbedded in that year's growth. In the year 1560 Indian arrowheads were found. In 1700 bullets had penetrated its sides. In 1807 results of an earthquake appeared. Dr. Woodpecker had also performed an operation, and, by the way, he does untold good in removing all traces of weevils, injurious insects, etc.

Time does not permit of giving further results of studying the cross section of this tree, its roots, branches, etc., but one familiar with this work cannot fail to be impressed with a feeling of sadness as he gazes upon the fallen giant, which has stood for centuries looking down upon the rise and fall of nations.

3. Prevent floods.
4. Hold moisture.
5. Hold sandy, shifting soil.
6. Leaves.
    a. Enrich soil.
    b. Protect soil.
    c. Coal, etc.
7. Homes for animals and birds.
8. Commercial value—See Lumber Outline.
9. Shelter and food.

V. Products.
1. Food—fruit, nuts, syrup, etc.
2. Miscellaneous—medicine, tar, turpentine, resin, rubber, tannic acid, lumber, camphor, etc.

QUESTIONS ON FORESTRY.

From what species of trees is the furniture in your home made?
Name five fruit trees common to your orchard.
What varieties of trees are found in your neighborhood?
Of what uses are the fallen leaves? Those on the trees?
From where does our maple syrup come?
How do trees breathe? What is the circulation of a tree?
What uses are made of the barks of different trees?
Give a list of trees from which food is obtained used in your home?
Where are the immense forests of the world?
What does the traveler's tree furnish, from which originated its name?
From what trees are the following obtained—dyes, tar, turpentine, quinine, camphor, rubber?
What causes forest fires? What means have been adopted to prevent them?
Is Arbor Day observed at your school? In what states is it observed? What are the lasting effects of this observance?
Give height and size of some of the largest trees of which you have read?
What do we mean by hard wood trees? Soft wood? Name some of each.
What is the bottle tree? Why so called? Where grown?
Where is ebony procured? For what is it greatly valued? What are its prevailing colors?
What remarkable size is attained by the redwood trees of California and Oregon?
Where is the bread fruit tree grown? Why so named?
Where does the rubber tree grow? Describe the process of rubber making.
What species of trees would you expect to see were you to travel in the Hudson Bay country of Canada? In Alaska? In Brazil? In the Philippine Islands?

BUTTER FROM TREES.

The fruit of the butter-tree of India yields a fixed oil which has the appearance of butter, and which may be used for all the purposes that cow's butter is used.

A NATURAL STREET-LAMP.

The traveler in the forests of India is often startled by the appearance of what seems to be an electric street-lamp. A nearer approach reveals the fact that the "lamp" is a bird's nest plastered all over with enormous fireflies, which are alive and attached to the nest by bits of moist clay. The baya bird that owns the nest does not like darkness, and has thus devised this plan of utilizing the lamps of the glow-worms.

—*Morton.*

Lumber

I. KINDS.
   1. Hardwood—mahogany, rosewood, ebony, etc.
   2. Soft woods—pine, cedar, etc.

II. SAW MILLS.
   1. Location.
      a. Lumber camps.
      b. Seaports, inland cities.
   2. Methods of sawing and handling trees.
      a. Large timber—Machinery.
      b. Small timber—Oxen, etc.
      c. Transporting to mill.
   3. Product.
      a. Rough lumber—logs, poles, planks, railroad ties, etc.
      b. Finished lumber—veneers, flooring, siding, interior finishings.
      c. Finished articles—furniture, implements, etc.

III. TRANSPORTATION OF LOGS TO DISTANT SAW MILLS.
   1. Methods.
      a. Rafting.
      b. Shipping by rail or water.

IV. DRYING.
   1. Kilns.
   2. Sun dried.

V. PURPOSES.
   1. Buildings—public and private.
   2. Railways—all equipment of wood, etc.
   3. Ship building and yards, etc.
   4. Furniture, etc.

VI. LUMBER PRODUCING COUNTRIES.
   1. Canada—British Columbia, Ontario, Quebec, other provinces.
   2. United States—Wisconsin, Michigan, Minnesota, Washington.
   3. Other—South America, Sweden, Russia, Germany, France, Mexico, Canada, Africa.

VII. COMMERCIAL.
   1. Fourth industry in United States.
   2. Leading industry in foreign countries.
   3. Lumber markets of world.

TEST QUESTIONS.

From what countries do our hard woods come?

What do we mean by veneers? Are they largely used? Where?

What cities in the United States are noted for their manufacture of furniture?

What determines the cost of different woods?

Why are mahogany and rosewood expensive?

In the construction of a frame house, what are the parts or pieces of lumber used and from what regions does the wood come?

Into what sizes are boards cut?

What are the names of the different pines used for lumber? Why is this wood largely used in construction work?

I finish my parlors in mahogany: trace from tree to room with the help of

LUMBER

1, Lumber Camp.
2, Log Train.
3, Log Pile by Lake.
4, Felling Trees.
5, Lumber Yard and Mill.

the following, expanding same all along the line: Tree located on a large ranch in Mexico, fifty miles inland, up river. Cut down by native Mexicans or peons. Hauled to narrow gauge railway by oxen and with many others hauled to mill on ranch. Cut into large logs. Rafted down river with others to port, loaded on vessel. Shipped to Halifax. Cut into different sizes of boards, veneers, etc. (Explain processes.) Dried. Shipped to Toronto yards. Sold to contractor building the house. Give full details of work, etc., by referring to THE NEW PRACTICAL REFERENCE LIBRARY, and with the help of the following questions:

In what time of year is the cutting of timber carried on? Why?
Where do the lumbermen live during this work?
How do they fell the trees?
How are the logs transported to the saw mills?
How is a log raft made? How is it towed to the mill?
How is lumber manufactured?

Where are the important lumber regions in Canada?
What machinery is necessary in a saw mill?
From what are laths made? Shingles?
How are the big trees in California and British Columbia handled?
How does lumbering rank as an industry in Canada? In the United States?
What is the value of the lumber produced yearly?
How many men are employed in this industry?
What skilful economy is practiced in the running of a saw mill?

Course of Study

The value of simple exercises and experiments in agriculture as a field of activity for the growing boy and girl is attaining a tardy but deserved recognition. The advantages to be derived from the study are at least the following: First, some information on subjects of great importance; second, the mental growth obtained from reasoning from cause to effect and from effect to cause; third, the mental development incident to the planning and successful executing of practical and valuable work. It is in the wish that these advantages may be extended even more broadly and enjoyed by an ever increasing number of American boys and girls that this course of study is included in the EDUCATOR.

It is believed that this work can be made genuinely interesting and helpful to the pupil, even though taught in the simplest way and by the most inexperienced teacher. Indeed, the more informal the method adopted in treating both the subject and the pupil the better will be the results obtained. The pupil's interest in all forms of nature will be enhanced. He will be led both to think and to do; the formal studies, as usually taught, do not do either. A connecting link will be formed between the school and the world outside.

Not all the work outlined need be done by each pupil; some of it is better adapted to older pupils; some to younger. Valuable and useful plans not included in this course may occur to the teacher, or it may seem wise to change the order in some cases, or even to omit some of the work altogether. We leave this to the teacher's judgment.

It is of the utmost importance that the pupil should actually do the work involved in carrying out the exercises, wherever possible. The training received by the pupil in actually doing the work is of far greater importance than the information he acquires in the process.

Some of the exercises are given in the form of experiments to be made; some, of papers to be written; and some, of questions to be answered. All information called for, which cannot be secured by outside inquiry, will be found under the appropriate headings in The New Practical Reference Library.

FIRST MONTH.

Weather Record.

Hang your thermometer where it will be protected from the extreme temperatures of both summer and winter. Rule a blank book in a manner suitable for keeping a temperature record throughout the school year, including temperatures taken at nine, twelve and four o'clock. Also record early and late frosts, description of the severest storms and other unusual weather conditions.

Prepare the following apparatus for making record of rainfall:

A deep, narrow cylindrical dish of tin or galvanized iron, a funnel of same material, having a diameter across the top just three times the diameter of the first dish, and made to sit firmly in it. Put it up securely somewhere, at a distance from buildings so it will not catch water from the roof. Measure the rain after each rainfall with a finely graduated rule, but record only one-ninth of your measurement, because the difference in the diameter of your dishes has increased the depth of rain nine times. Make a place for recording these measurements in the same table with your temperature record.

What is the nature of the land in your neighborhood as to roughness of surface? Presence of forests? What kind of a surface must land have in order to be well fitted for agriculture? How does the land in your country compare with land in other parts of the country in these matters?

What is soil? Is the soil in your neighborhood chiefly sand, clay, vegetable or loam? Get and preserve samples of as many different soils as you can find in your neighborhood; examine them carefully, classify them as suggested above, and decide which you think is best adapted for growing crops. What adjective do we use in describing such a soil? What kind of soil is there on your farm? Do corn, oats, wheat and potatoes all thrive equally well in the same kind of soil? What kind of soil is best adapted to each? What crop thrives best on your farm?

Is the soil only on the surface of the ground, or does it extend a long distance downward? Can soil wear out? What can be done to prevent its wearing out? What is meant by "rotation of crops?" Is new soil made when old soil wears out? If so, where does it come from? What becomes of the old soil? Notice the dirty water flowing along the road after a hard rain. Is there soil in it? Where does this soil go to?

Will soil alone grow crops? If not, what else is necessary? Cultivation of the soil loosens it so the plants can get through, lets air into it, and prevents it from drying out quickly, thus making it more productive in a dry season.

In the different samples of soils which you collected plant some common seeds, such as peas and beans, and see which soil gives you the best results.

Name the eight leading farm crops raised in your vicinity; the five most common vegetables and the five most common fruits. Discuss the different uses of each one and its comparative importance.

Make collections of each of the grains and seeds which you have enumerated and keep each collection in a separate envelope or little pasteboard box, labeled with name of contents and name of collector.

SECOND MONTH.

What weed in your neighborhood causes the most trouble to farmers? Which will thrive with the least care, crops or weeds? Which are hardest to kill? Some weeds spread by growth from the roots; some by producing millions

of seeds which become dry and are scattered by the wind. Study some of the weeds in your neighborhood by collecting samples of their seeds, as you did in the case of the grains. Decide whether each weed spreads by its roots or its seeds. Select certain patches of each kind and see if you can kill them out so they will not grow next year. Notice the soil where these weeds grow and compare it with the soil where grains grow.

What are the most common trees in your neighborhood? Do they have seeds? Gather perfect leaves of each one; press them in a book and label each with name of the tree from which it came and name of the collector. Classify the kinds of trees from which the leaves came as to: 1st, commonness in your neighborhood; 2nd, size; 3rd, color and hardness of wood; 4th, roughness of bark; 5th, use of wood. What common tree yields one important product during its life?

Fill a box about one foot square and one foot deep nearly full of warm, moist earth, at different places in it plant two or three kernels of corn, two or three peas and one fair sized potato. Keep careful watch of your plantings and once each week for a month take up each plant very carefully, examine it, record description and make a drawing; then very carefully restore it to its place. The soil must be kept moist, and not allowed to get cold.

Name the domestic animals that are useful only after death; those useful only before death; those useful both before and after death.

Make a map of your township, showing all main roads, streams, churches, schoolhouses and farms. Calculate how far the average country pupil has to go to school.

THIRD MONTH.

In a suitable box, in one corner, plant a few kernels each of oats, wheat and barley, one inch deep; in another corner make a similar planting four inches deep; in the third and fourth corners make plantings seven and ten inches deep. Make a record of the depth of your planting and the time when each sprout appears above the soil.

Write an essay on each of the following: Cow, sheep, pig, poultry, discussing among other things:

1. General description.
2. Number of legs.
3. Size:
   - Average height.
   - Average weight.
4. Peculiarities of teeth.
5. Kind of food eaten.
6. General usefulness.
7. Number kept on average farm.

How many chickens are kept on your farm? What breed are they? What breed is best for egg-laying? What else are chickens used for? What is their most profitable use, and what breed is best for this use? How does the profit received from the poultry on your farm compare with that from the grain? From the milk? How does the value of the poultry products of the whole country compare with the value of the wheat crop?

Enumerate all the products of some farm that you are acquainted with and classify them as to products of the soil or animal products; compare the values of these different products; what is the total profit yielded by the farm for the last year? The average profit per acre?

Learn to spell and locate the following parts of a horse's body: Gullet, muzzle, withers, hock, pastern, coronet, arm, crest, hamstring, croup, cannon, fetlock and hoof.

FOURTH MONTH.

Make plantings of beans and an onion (not onion seed) similar to the planting suggested for the second month, and make observations and records in the same way.

From what source does the earth get its heat? Is cold something positive like heat, or is it due merely to the absence of heat? Where on the earth's surface is it hottest? Where is it coldest? Why this difference? What is climate? In what kind of climate is it healthiest to live? In what part of the world is such a climate found? How does the climate influence the development of a people? Compare natives of South America with those of North America.

From inquiry among farmers find out what it costs to keep their horses a year, and calculate the average cost per horse per year. Do the same with sheep, cattle and swine.

What is the best breed of cattle in your neighborhood for beef purposes? For giving milk? How much milk will a good cow of this breed give a day and what per cent of butter fat will it test? Compare these figures with those from an ordinary cow. How does milk compare with other products of the farm as a source of profit? How many cows per acre can be profitably kept on a farm?

Select several ears of corn; measure and record the length of each and its circumference at the middle of ear; count the rows and kernels in each row. Break the ears in two and make drawings of the cross-sections. Shell off all the corn (saving the kernels) on one side of each ear, and make a drawing of that side, showing the edges of the kernels; shell off all the corn and compare weight of each cob with weight of the corn that came from it. What per cent of weight of both is really corn? What is the average value of the annual corn crop in the United States? Of what country is corn a native? How many kernels of corn should be planted in a hill? How many stalks usually grow in a hill? Are all corn cobs or kernels the same color? How many ears usually grow to a hill? Calculate how much it costs to raise an acre of corn, including seed, labor, rent, machinery, etc.

Write a history of the farm on which you live from the earliest time that you can get information, tracing its ownership from the government, if possible, telling when it was first cultivated, when its buildings were erected, etc.

FIFTH MONTH.

Make a map of your farm showing its different fields, buildings, barnyard and houseyard; how many acres are planted to each crop, how many acres are in pasture, etc.

What is the principal constituent in milk? What are the two next most important constituents? How does cream differ from milk? In what two ways can it be separated from milk? Inquire about and name all the ways in which milk or its products can be used. In what way is most of the milk produced in your neighborhood used? Do you know of any other animal than the cow whose milk is used for food? What happens to milk that has become too old? What hastens this action? How can it be prevented?

With a knife introduce some of the matter of a rotten apple into a good one, then set it away and watch results.

How do plants and flowers get their moisture? Put a small, live, green plant in a bottle of red ink and watch results for several days.

Make a plan of your barn, or an original plan that you think would make a good farm barn.

If your father is fattening some pigs see if you can weigh one of them; then keep track of the corn fed to it and calculate whether the corn would have brought more if sold at the market price.

Compare the condition of some piece of machinery that has stood out of doors a good deal in rain and snow, freezing and melting, with machinery that has always been protected from the weather. Which method of treating machinery do you think will make it last longer?

SIXTH MONTH.

Inquire from some dairyman and write an essay on the best method of caring for milch cattle and for the milk after it has been drawn and before it has been delivered to the creamery.

What is temperature and how do we estimate it? Describe a thermometer. What is the freezing point? The boiling point? Name all the uses of the thermometer of which you can think.

Cut a lemon, an orange, a banana and an apple in two crosswise pieces; describe carefully and illustrate, by drawing, what you see.

Take samples of several different kinds of grains that your father intends to sow in the spring; carefully count each kernel, also any other seeds found in the grain, and estimate the percentage of purity of the grain.

If there is in your neighborhood a good example of a pure breed of some domestic animal and you can get the necessary information, write an essay on it, telling all the interesting things you can find out and showing how the breed is superior to common animals of its kind.

Find out by inquiry some of the most troublesome insects in your neighborhood and write an essay on each, mentioning among other things: Name, size, color, number of wings, number of legs, how it makes itself disagreeable, time of year and time of day at which it appears, whether it attacks people or animals and how it can be got rid of.

SEVENTH MONTH.

What are clouds? Of what good are they? Describe different kinds of clouds. What is dew? Do you find it only on top of the leaves, or on the under side also? Where do you think it comes from? What makes it form on the leaves? How long does it remain and what drives it away? Put some cold water in a pitcher or pail and let it stand in a warm room. Does dew appear on the dish? Where does it come from? Where does it go and why? Compare frost with dew and answer above questions in regard to it.

Select eight ears of corn to test. Fill a shallow box about two feet square half full of warm, moist earth or sawdust and cover it with a cloth wet in warm water; number each corner and middle of each side of the box with numerals from 1 to 8; take six kernels from each ear of corn and put them in the box near one of the numbered places, at the same time numbering the ears to correspond with the numbers on the box. Cover box and corn with another warm, wet cloth and at the end of five days see what kernels have sprouted and calculate what percentage of the corn from which the eight ears were taken will reproduce.

Plant in a suitable box, at the same depths, seeds of the pumpkin, squash and cucumber; record time of each appearance, describe the sprout and make a drawing of it.

Make a careful study of the horse, using the following outline, which is developed from the information furnished in THE NEW PRACTICAL REFERENCE LIBRARY. Write an essay embodying this information and answering all questions suggested.

HORSE.

- Description.
  - Hoof.
    - Shape.
    - Formation.
  - Legs.
    - Number.
    - Shape.
    - Parts.
  - Body.
    - Form.
    - Grace.
    - Structure.
    - Tail.
  - Head.
    - Shape.
    - Beauty.
    - Ears.
    - Mane.
- Characteristics.
  - Intelligence.
  - Senses.
  - Fleetness.
  - Strength.
  - Faithfulness.
- Classification.
  - Draft horses.
  - Ponies.
  - Thoroughbreds.
- Uses.
  - Farming.
  - Traveling.
  - Hauling.
  - Racing.
- History.
  - Introduction into America.
  - Origin of
    - Thoroughbreds.
    - Draft horses.
    - Ponies.
    - Wild horses.
- Food.
  - Hay.
  - Oats.
  - Bran.
  - Grass.
- Treatment.
  - Kindness.
  - Care.

QUESTIONS ON THE HORSE.

Give five reasons why the horse is such a useful animal.
When were horses first introduced into America? By whom?
How do you account for the wild horses found in America?
What three groups of horses are found in America? For what is each used?
What breed of horses are considered to be the swiftest and most beautiful?

EIGHTH MONTH.

Observe whether the cow, horse and sheep eat grass in the same way. Can you tell the reason for the difference? Do they lie down and get up in the same way?

Watch carefully for the coming of the first birds and record the time of their arrival. Where have they been all winter?

Tie a string around the new, green sprout of some tree or shrub and note carefully the growth of the sprout as the season progresses.

Prepare a small garden in the school yard or at home and plant in it seeds of the common flowers and vegetables, taking care to have all conditions favorable. The ground should be kept soft, loose and free from weeds all the spring. Note the progress of your garden carefully and keep a record of the development of your plants and flowers.

Set out a soft maple, box-elder, or other quick growing tree and keep it in good growing condition.

Figure out now the average temperature at nine, twelve and four o'clock since you began keeping your record; also the total rainfall and the average daily rainfall.

WHEAT

1, Harvesting.
2, Threshing.
3, Steel Elevator.
4, Interior of Flour Mill.
5, Wheat Plants.
6, Products.

Wheat

I. General Description.
   1. Plant as a whole
   2. Stalk
   3. Leaves
      (a) Shape
      (b) Color
      (c) Length
   4. Fruit
      (a) Size and shape of head
      (b) Kernel or berry

II. Varieties.
   1. Spring Wheat
   2. Winter wheat

III. Process.
   1. Planting
   2. Harvesting
   3. Threshing
   4. Transporting
   5. Milling

IV. Distribution.
   1. United States
   2. Canada
   3. Russia
   4. Argentina
   5. France
   6. Germany
   7. India
   8. Egypt
   9. Australia

V. Production.
   1. Kansas
   2. North Dakota
   3. South Dakota
   4. Minnesota
   5. Oklahoma
   6. Nebraska
   7. Indiana
   8. Missouri
   9. California

VI. Products.
   1. Flour
   2. Bran
   3. Middlings
   4. Straw Board
   5. Straw Paper

VII. History of the Industry.

TEST QUESTIONS

What is the average yearly production of wheat in the United States?
What are the other leading wheat producing countries in the world?
What proportion of the world's crop does the United States produce?
What machines are used in preparing the soil for wheat?
Who invented the harvester?
With what tool did our forefathers cut their grain?
Is that tool still in use?
Name the different varieties of bread that you know.
Which do you consider the best? Why?
For what is wheat straw used?
Where are the great wheat regions of Canada?
How long has wheat been known?
Of what region is wheat probably a native plant?
What is *bearded* wheat? *bald* wheat?
What is red wheat?
What is known as hard wheat?

Essays on Corn

The reason that composition work is often so unsatisfactory, and that pupils consider it the worst kind of drudgery, is because they are assigned themes which they do not understand and upon which they can obtain little or no information. The exhaustive treatment of school subjects in THE NEW PRACTICAL REFERENCE LIBRARY makes it an invaluable aid to the teacher who wishes to make her work interesting and successful.

Below are given a few essays on corn, prepared after a study of articles and illustrations in THE NEW PRACTICAL REFERENCE LIBRARY pertaining to this subject. These essays are given to show teachers how the subjects presented in this work can be used to advantage, and as illustrations of what may be done in other subjects.

The illustrations are simple and such as any pupil will delight in drawing. If, however, the teacher feels unable to supervise work of this kind, very interesting illustrations can be found in catalogues of farm implements and articles in agricultural journals and other periodicals. These can be cut out and pasted on the pages of the essay.

On this and the eight pages following we have endeavored to present these essays in form not more artistic than the work of the average boy and girl can be made. If the student sees that he can write and draw as well as the writing and the illustrations shown in the book, it is a matter of encouragement to him.

Description of the Corn Plant

Carolyn Ives

Corn is a sort of grass, that is, like wheat, barley, rye and oats, it belongs to the grass family. It is raised in almost every country having a warm or temperate climate.

The plant grows from four to twelve feet high, according to the variety. The stalks are jointed, dark green and purple in color, and are concave on one side. The leaves appear at the joints and partially enclose the stalk where they seem to grow from it. They are long, slender and pointed and when fully grown bend over so as to give the plant a very graceful and beautiful appearance.

Corn has two kinds of flowers: those growing at the top of the stalk and forming the tassel, and those found in the ears. The first kind is called staminate flowers because they bear only stamens. The second kind consist of the silk and constitute the pistilate flowers, because the silk is nothing more nor less than a cluster of pistils, each of which ends in a kernel of corn on the ear.

The ears appear in the axils of the leaves at the joints. They are covered with a kind of leaf called husks. As the corn begins to ripen, the husks open at the top, showing the yellow kernels beneath, and the larger ears because of their weight, bend over so that by the time they are fully ripe they hang downward. The ears begin to form at the lower joints on the stalk, and the lowest ears are the oldest and the highest the youngest.

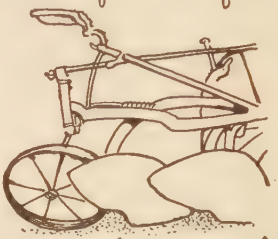
The roots extend far into the ground for the purpose of obtaining moisture and food from the soil. Could a corn plant be removed from the earth so as to have all of its roots joined to it, their number and length would surprise us.

When growing, the corn plant is of a deep green color with a brownish or purplish tassel at the top, and stalks that are purple on one side. The early frosts tend to turn the tips of the leaves and some of the husks a yellowish-brown; this color deepens and increases in extent as the corn becomes ripe. At any season of the year a field of corn is a beautiful sight.

Preparation of the Ground.

Mary Martin

The farmer who looks forward to a good crop of corn uses great care in preparing the ground. The soil must be made mellow and fine so that the roots of the corn can penetrate it and absorb nourishment.



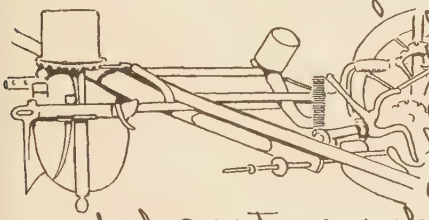
The ground is first plowed to a depth of seven or eight inches. On small farms, where but little corn is raised, the old-fashioned plow, turning but one furrow, is used, but on the large farms in the corn belt, gang plows turning two, three and sometimes more furrows are employed. On ground that has previously been plowed, a gang plow turning three furrows is easily driven by four horses, and can be operated with three horses. The driver rides and controls the team and plow from his seat. Some very large gang plows are hauled by steam engines.

After plowing, the ground is harrowed. If the ground is old and mellow, only a toothed harrow is needed, but on new ground and ground where the soil is hard and lumpy, the disk harrow is used first and is followed by the common harrow. The harrowing is continued until the soil is made fine and smooth for planting.

Planting and Cultivating Corn.

Mary L. Everts

On the small farms in New England and other Eastern states, much of the work is done by hand labor. On the large farms in the corn belt, however nearly all of this work is done by machinery. The



corn planter generally used has two wheels and two sharp runners. These runners make a small furrow, into which the seed is dropped from boxes connected with a device known as a checkerboard. These machines are drawn by horses, and the best of them plant four rows at once, and with a good team, a machine will seed about ten acres in a day. For the large dent corn, the rows are four feet apart each way. This gives each hill of corn 16 square feet of ground. Sometimes another kind of planter is used, in which discs take the place of runners, as shown in the picture. In both kinds of planters, the wheels press the soil over the corn in the furrow.

Soon after the corn comes up, cultivating or plowing, as it is usually

called, begins, and continues every few days until the corn is so large that further cultivation is liable to injure the plants by breaking the stalks and disturbing the roots. The corn is then "laid by" until the harvest.

A cultivator is used in plowing corn. It destroys the weeds, and stirs the soil. The cultivator has two wheels supporting a framework, to which beams bearing hoe shaped teeth are attached. The cultivator is drawn by horses and guided by two handles, which extend back from the frame. One or two rows are plowed at a time. After the field is plowed one way it is usually plowed the other way so that the second plowing crosses the first.

The old way of cultivating corn was far different. A cultivator was used to plow between the rows one way; then this left a good part of the work to be done with the hoe. The work was slow and tiresome. If two men hoed an acre of corn in a day they called it a good day's work. Later a small cultivator was used, and this removed the weeds between the rows. This method is still used in regions where only small fields of corn are planted.

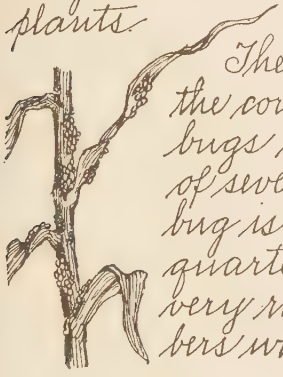
Enemies of the Corn Plant

Henry Andrews

The corn plant has many enemies, and from the time the plants appear above the ground until the crop is harvested, the farmer must be on the watch for them. Among these pests are caterpillars, bugs, beetles and root worms.

The root worm bores its way into the root from the end, and soon kills the plant. Soil which has produced corn for a number of years is usually full of these worms. They shorten the roots and destroy their power to nourish the plant. Root worms can be destroyed by planting the ground with other crops for two or three seasons.

The cut worm is the caterpillar of a small moth. It works in the night. When numerous, these worms do much damage because they eat the plant off just below the surface of the ground, thus destroying much more than they eat. Cut worms are small jointed worms about an inch long and having a shining, dark brown color. They are difficult to destroy because they feed upon so many different plants.



The chinch bug is the worst enemy of the corn plant. In some seasons these bugs damage the corn crop to the extent of several millions of dollars. The chinch bug is a small insect, being less than a quarter of an inch long, but it multiplies very rapidly so that it makes up in numbers what it lacks in size. The bugs gather in masses on the stem and leaves of the plants and soon destroy them.

When they have destroyed the plants in one field, they move to another, sometimes going as far as a quarter of a mile. Since the bugs do not fly on these journeys, fields that are free from them can be protected by plowing a deep furrow around the field. When the bugs reach this furrow they can be killed by scattering straw in the furrow, sprinkling it with kerosene and burning. The bugs pass the winter in the roots and stubble of grass and plants that grow around fences. If these places are burned over in the fall most of the bugs will be destroyed.

Though it is not an insect, smut may be considered an enemy of the corn plant for it sometimes causes much damage to the crop. Smut is a sort of plant which lives and grows in the corn plant. It starts from a little body called a spore, and is so small it can be seen only with a microscope. The spores fall upon the young plants, work their way into the leaves and stalks and grow there. They send out little threads which enter every branch and ear of the corn. These threads form new spores in the kernels and before the corn is ripe they burst through the kernels and give off a quantity of spores which look like fine black powder.

Harvesting Corn

Thomas Martin

Until within a few years corn was harvested and husked entirely by hand. The ears were broken off and the stalks left standing and were considered worthless. Now, by the use of the corn harvester, the corn is cut and the stalks are pushed under a binding frame, bound and raised on a platform from which the shock is set upon the ground. The corn harvester is similar to the reaping machine, but it works with a slower motion.

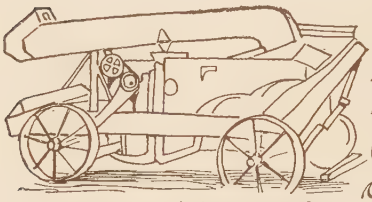
Husking or shredding follows cutting and binding. The shocks are hauled to the farmyard, and the stalks are run through the shredder. This machine breaks the ears from the stalk and removes the husks, dropping them in one place and the clean ears in another.

The part of the machine which does this work so neatly is made up of a frame which has from two to six steel rollers, containing flanges, and so geared that the rollers in each pair turn towards each other. The rollers are about four feet long, and the frame has one end lower than the other, so that the ears, as they are husked, can slide down the incline and drop out. Some shredders have a sheller attached to them, but in order to have this work successfully, the corn must be thoroughly dried before shredding. Usually the farmer prefers to store the corn in the ear in cribs until it is thoroughly dry.

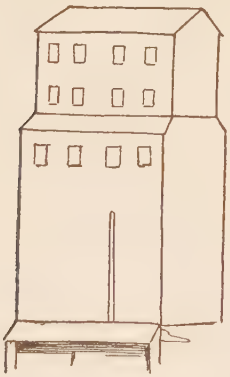
Marketing the Corn Crop

Arthur Clark

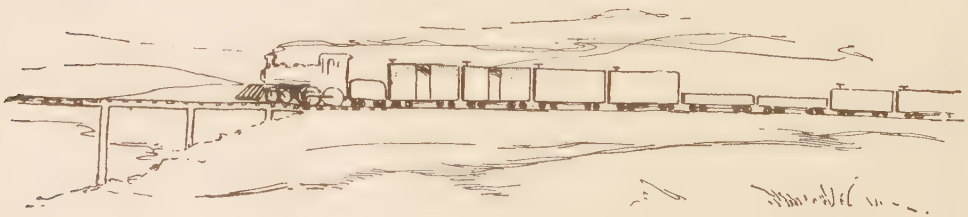
After the corn is husked, it is stored in long, narrow buildings called cribs. The sides of the cribs are made of narrow boards nailed to uprights so as to leave a space about an inch wide between the boards. This allows the air to circulate through the crib and dry the corn.



After the corn is dry, it is shelled by a sheller operated by steam or horse power. The corn is then hauled in wagons to the nearest elevator, from which it is loaded into cars and shipped to large cities. From these centers it is distributed to the mills and manufactories which make the various corn products.



Poor roads are a great hindrance in marketing the corn, and every movement to secure better country roads, and to reduce freight rates is a movement towards giving the farmer greater profits on his crop.



Domestic Science

A few suggestions on Domestic Science, or Home Economics, logically follow the outline of a course in Agriculture. Just as the old, unscientific methods of agriculture are being replaced by scientific methods which prevent waste while they increase production, so are scientific methods being applied with equal success to the management of the home.

This change has been brought about by the remarkable advancement in the application of the various branches of physical science to everyday affairs, and by the change in industrial conditions, especially the growth of great corporations, which necessitates the gathering of such a large portion of our population in cities and towns.

Formerly the home was the center of many industries. The women of the household prepared and cooked the food and made the clothing of the family, and in the days of our forefathers they even spun the yarn and wove the cloth from which the clothing was made. Now practically everything needed is prepared in the factory, and in towns the bakeshop furnishes all varieties of food prepared for the table.

As a consequence, girls do not receive the training in home making formerly considered so essential to every girl's welfare. The work outlined below is purely suggestive. The details and methods of presentation should, in each instance, be elaborated by the teacher and so shaped as to meet the needs and conditions of her school.

FOOD.

(a) Meat.
Kinds, Cuts, Food value, Ways of preparing, Digestibility.

(b) Bread.
Kinds, Food Value, How made, Digestibility.

(c) Vegetables.
Kinds, Food value, How prepared, Digestibility.

WATER.

Sources, Kinds, Uses.

AIR.

Composition, Properties, Purity, Ventilation.

CARE OF HOME.

Sweeping, Dusting, Washing woodwork, Making beds, Washing clothing.

CARE OF THE PERSON.

Amount of food and sleep, The morning wash, General cleanliness, Bathing, Caring for hair, teeth and nails.

SEWING.

Kinds of cloth and purposes of each, Threads, Needles, Styles of sewing.

QUESTIONS

From what part of the beef is sirloin steak cut? Porterhouse?

From what parts of the carcass are the cheap cuts obtained?

What are some of the most common sources from which impurities in water arise? How can you test water for impurities?

What a piece of work is man! How noble in reason!
How infinite in faculties! In apprehension, how like a God! —*Shakespeare.*

Anthropology

The science of man as a study is of primary importance to the race. Taken in its broadest scope, it includes all the sciences in their relation to the history of human life.

These various subjects are outlined in this Educator under the topics of PSYCHOLOGY, PHYSIOLOGY, LITERATURE, etc., and found fully treated in THE NEW PRACTICAL REFERENCE LIBRARY.

As a direct study we present herewith an outline showing the various branches of the human race as developed from the treatment of the INDO-EUROPEAN, SEMITIC, and HAMITIC races, together with the many correlated subjects, as PHILOLOGY, SANSCRIT, etc., which are treated so interestingly in THE NEW PRACTICAL REFERENCE LIBRARY.

We also submit you outlines on the American INDIAN and CLIFF DWELLER, with suggestive questions. The successful student should not only develop simple outlines in connection with the study of the various races and types of people, but also in connection with the language, dress, sustenance, shelter, tools, weapons, their religious beliefs, family relations, customs, legends and superstitions, and the hundreds of sub-topics which will be found treated so interestingly therein. The observing student will find much of interest and value in a study of the splendid colored illustrations of the various races found throughout the LIBRARY.

TEST QUESTIONS ON ANTHROPOLOGY.

Name the races of man. What seems to have been the basis of this classification? Name the races found in your own city or county.

Why was the Caucasian race thus named? What territory is controlled by them?

Which are the more progressive, the Chinese or Japanese? What territory is inhabited by the yellow race?

What are the chief characteristics of the Malay or brown race?

Has a negro tribe ever been known to develop a civilization without help of other races?

Does Darwin account for origin of species? What is the Darwinian theory?

What are a few of the theories concerning the origin of man?

What are the characteristics that distinguish man from all other animals?

Is man the only animal with a moral sense of right and wrong?

Distinguish between the terms intellect and instinct.

Give reasons for the decline of the indian. What white people have intermarried with them?

How do the Mexican and Central American indians compare with those of the north and the extreme south?

When did the negro question in the United States become a national one?

Along what lines does Booker T. Washington advocate the education of the negro?

Is man a social animal? Give reasons for your opinion.

Give a few of the methods by which primitive man communicated with his fellow. Name methods of the present time.

Describe efforts of primitive man in his struggle for food, shelter, dress. Was dress originally only ornamental?

What were the weapons and tools of primitive man? Did he regard all men as brothers? To what bounds was his sense of right and justice limited?

How were sports and pastimes regarded by early peoples?

The Eskimos are supposed to be akin to what race? What does the word mean? How do they compare with the indians in progress? Why were the Cliff Dwellers so named?

Divisions of the Human Race

I. Ethiopic Division.
   1. African Negroes (Soudanese, Bushmen, Hottentots, Nubians, etc.).
   2. Oceanic Negroes (Papuans, Australians, Negritos).

II. Mongolic Division.
   1. Northern Mongols (Japanese, Coreans, Manchus, Finns, Lapps, Magyars, Hungarians, Bulgarians, Turks, Tartars).
   2. Southern Mongols (Tibetans, Chinese, Burmese, Siamese).
   3. Oceanic Mongols (Malays, Filipinos, Natives of Formosa and parts of Madagascar).

III. American Division.
   1. North American Indians (Eskimos, Algonquins, Iroquois, Sioux, Shoshones, Pueblos, etc.).
   2. Central American Indians (Aztecs, etc.).
   3. South American Indians (Caribs, Pampeans, Patagonians, etc.).

IV. Caucasic Division.
   1. Teutonic Branch.
      a. Scandinavian Family (Swedes, Norwegians, Danes).
      b. Dutch Family (Hollanders).
      c. Anglo-Saxon Family (English, American, etc.).
      d. German Family (Saxons, Prussians, etc.).
   2. Alpine Branch.
      a. Celtic Family (French, Welsh, Irish, Highland Scotch).
      b. Slavic Family (Russians, Poles).
      c. Albanians, Roumanians, Armenians.
   3. Mediterranean Branch.
      a. Iberian Family (Basques, Kabyles).
      b. Italian Family (Etruscans, Corsicans, Sardinians, Sicilians, etc.).
      c. Greek Family (Pelasgians, Hellenes).
      d. Hamitic Family (Egyptians, Berbers).
      e. Semitic Family (Arabs, Phœnicians, Hebrews, Assyrians, Chaldeans, Babylonians).
      f. East Indian Family (Dravidians, Hindus).
      g. Iranian Family (Medes, Persians).

Authorities on ethnology differ widely in their classification of the human race, and the most important of these differences is in the division of the Yellow Race. Some authorities divide this into Mongolian and Malay, while others consider the Malay a division of the Mongolian, as in the outline here given.

TEST QUESTIONS ON RACES OF MEN.

What races of men have you seen?

Name the different nationalities of the white race.

Are the races as distinct and separate as they were originally? Why?

Which race is the smallest in number? The largest? Give reasons.

Which race is the most civilized? Give reasons. The most barbarous? Why?

To what race does the native Mexican belong?

What nationalities are known as the dark type of Caucasian? The fair type?

What was the native home of each of the races and what are some of the causes of their wide distribution?

To what race does each of the following belong: Swede, Hindu, Italian, Japanese, Esquimaux, Russian, Spaniard, native Filipino, Turk, Arab, Persian, Jew, Pole?

What are some of the wandering tribes of the earth and their location?

What do you understand by the terms savage? Semi-barbarous? Give examples of each.

How did the Aztec Indians compare with those of the United States?

How does the Ethiopian race differ from the Caucasian races, mentally, morally and physically?

Who are the Bushmen? Hottentots?

Why are the peoples of Asia as a rule so much behind European nations in progress?

What people of Asia has adopted European customs and with what result?

What part of Asia is inhabited by the Caucasian race? Why?

Why was America colonized long before Africa?

What characterizes the nations that live along the seacoast?

Describe the native Australian. To what race does he belong?

Of what race does the greater part of Australia consist? What has caused this?

In a barbarous country how do the inhabitants along the coast compare with those farther inland? Where are the most ignorant people found in Asia and Africa? Give reasons.

The Chinese form what per cent of the world's population?

Does the degree of civilization of a country depend upon its age? Give an example to illustrate your answer.

What has been the main cause for the distribution of the negro?

The immigrants of the United States represent what nations?

What effect does climate have on the races of men?

Why does the Caucasian race dominate the world? What are the chief factors in their progress?

By reference to the colored plates illustrating Mongolian and negro types which would you say represented the highest state of civilization?

If all the peoples of the world were stood in a line, every fourth one would belong to what country?

Judging from the appearance of the Masai type of negro in colored illustration, what would you say as to his civilization? What is striking about his head?

By referring to Figure Nine of the Mongolian types, what uncivilized practice do you note?

What is remarkable about the costume of the Kashmir type as seen in illustration? For what are these people famous?

Indians, American

Indian Affairs
Indian, Education of the
Indian Reservation
United States Indian Training and Industrial School

Five Civilized Tribes.
- Cherokee
- Chickasaw
- Choctaw
- Creek
- Seminole
  - Osceola

Iroquoian Indians
- Five Nations
  - Cayuga
  - Mohawk
  - Oneida
  - Onondaga
  - Seneca
- Huron
- Tuscarora

Algonquian
- Arapahoe
- Cheyenne
- Delaware
- Illinois
- Kickapoo
- Miami
- Narragansett
- Ojibway
- Ottawa
  - Pontiac
- Pequot
- Pottawatomi

Athapascan
Caddoan
Muskhogean
Shoshonean indians
- Moki

Siouan

DISTRIBUTION.
North America.
- (a) Canada
- (b) United States
- (c) Mexico

South America.
- (a)
- (b)
- (c)

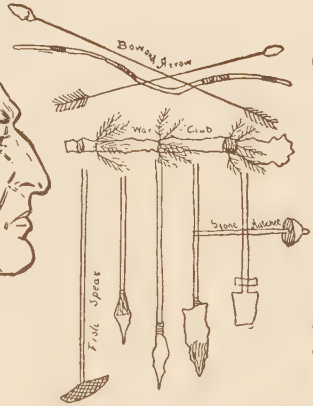
DRESS.
- Skins
- Woolens
- Feathers
- Shells
- Bark
- Tattooing

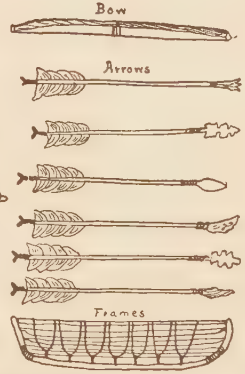
GAMES.
- Ball
- Racing
- Canoeing
- Fishing
- Hunting
- Singing
- Dancing
- Wrestling

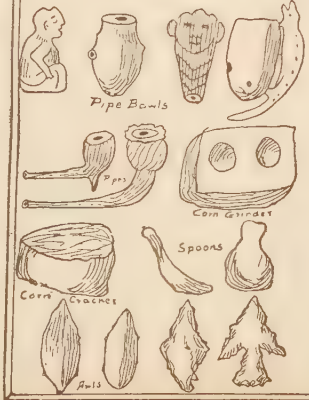
INDUSTRIES.
- Blankets
- Baskets
- Pipes
- Knives
- Arrows
- Fish-hooks
- Leather
- Pipes

BURIAL.
- Earth
- Platforms

NOTE: It is to the credit of the indians of the United States that with but few exceptions they preferred death to any form of slavery or servitude, and have therefore maintained for the race final equality with the white men. —*Chancellor.*







ABORIGINES OF AMERICA

Origin
Number
Chronology
Ethnology
Civilization
Progress
Education
Characteristics
Appearance
Age
Size
Perpetual Warfare
Habits
Inventions
Money
Domestic Life
Cultivation of Soil
Occupation
Mode of Travel
Language
Records
Archaeology
Religion
Disposition
Endurance
Hieroglyphics
Government
Tribal Relations
Family Relations
Clans
Dwellings
Divisions
Savage
Barbarous
Half Civilized

—Rouch—

TEST QUESTIONS ON INDIANS.

Were horses used by the indians before the Spanish explorations?

Who gave indians their name? Why?

What are the indian tepees or wigwams? How were they made by the plains indians? By those in the lake region? Why the difference?

How many indians are found at present in North and South America? How many of this number resided in the United States in 1900?

How and of what material were the houses of the Pueblos constructed and how arranged? What was peculiar about the houses in the lower tiers?

Without doors and windows, how did the Pueblos gain entrance to their homes?

By close observation of the Pueblo types as shown in colored illustration, what arts would you say were highly developed by this tribe?

In time of ceremony how did the indians dress and decorate themselves? When and why did they paint their faces and bodies?

What tribe made maple syrup? The cultivation of corn, beans, squashes, etc., was practiced by what tribe? Which tribe cultivated tobacco? What tribe hunted extensively?

How and from what did the indians make knives? Fish hooks? Needles? Axes? Pipes? etc. What did they make from rushes and grass? What was remarkable about some of their baskets? Did they know the art of making leather?

What specimens of indian work have you in your home?

What games did the indian boy play common to his white brother? What was the highest ambition of the Indian boy?

Where were the dead generally buried? What was generally buried with the deceased?

What were the duties of the medicine man? What were the great spirits of the indians? How did they consider the wind? The rain? How did they regard every living thing?

What are indian reservations? How many in the United States? Where is the largest in the country? Are the indians of reservations citizens?

Name five of the principal indian tribes. Name three of the principal indian wars.

What indian maiden saved the life of Captain John Smith? Whom did she afterward marry?

What indian name has been made world famous in one of Longfellow's poems?

What is meant by indian summer?

By a study of the various types of the human race as shown in colored illustrations, how do the indians compare in dress and intelligence with the Mongolian? With the negro?

What did the indians of Mexico and Central America know of books, astronomy, arithmetic, etc., at the time the Spaniards invaded their country? How did their civilization compare with the Spaniards'?

Cliff Dwellers

I. Origin.

II. Habitations.
  1. Kinds.
    a. Cliffs.
    b. Caves.
  2. Location.
    a. Mexico.
    b. New Mexico.
    c. California.
    d. Arizona.
  3. Construction.
    a. Methods.
    b. Material.
    c. Shape.
    d. Size.
  4. Purposes.
    a. Domestic.
    b. Protection in war.
  5. Ruins.
    a. Relics.
    b. Mummies.
    c. Pottery.
    d. Weapons.
    e. Utensils.

III. Civilization.
  1. Occupations.
    a. Agriculture.
    b. Irrigation—ditches, etc.
    c. Manufactures.
  2. Government.
    a. Tribes.
    b. Chief.

TEST QUESTIONS.

For what special purpose were the cave dwellings used? The cliff houses?
What other dwelling places have been found?
What proof have we of long sojourns in these places?
How many persons could a single "cliff palace" shelter?
What materials were used in the construction of their dwellings?
What do the circular ruins contain?
What are the theories regarding the use of the subterranean building in the center?
What determined the shape of the cliff houses? At what altitude were some of them built?
What have recent researches revealed as to their water supply? Ruins? Relics? Mummies?
What valley is strewn with ruins?
What strange symbols are to be seen on the walls?
What interesting discovery has been made by recent explorations?
What evidences of handicraft have been found?
Among what tribes was agriculture carried on?
What particular device shows their skill and industry?
What domestic animals did they raise?
Have the excavations ever resulted in the discovery of any metal objects?
Of what material were their weapons and other implements made?
What is a striking feature of their pottery?

The school makes possible the higher life when it teaches the pupil to think. Right thinking puts intelligence into the labor of his hands, increases his earning power, lays the foundation for his physical well-being, and lifts him above an existence that is a mere struggle for bread. —*Schaeffer.*

Arithmetic

INTRODUCTION.

Definition of Number.

"Number is a product of the mind's action," says Dr. Dewey, the psychologist, "in making a vague thing *definite.*"

The late Commissioner of Education, W. T. Harris, said: "The idea of number will at first be grasped by the pupil imperfectly. He can see only some phases of it. Later he will arrive at operations which demand a view of all that number implies."

Subject-Matter.

The subject matter of arithmetic is of two kinds—*abstract* processes and *concrete* problems, or, pure arithmetic and applied arithmetic. The processes may be thought of as instruments to work with; the problems as the real life-questions that the children must solve.

Outlines.

The outlines of work have varied greatly in the past, and are not exactly the same now in any two localities; but the variations are slighter. For instance, we no longer find "long division" placed where very young children would be forced to do it. The outlines appended here are based on what is generally conceded to be the proper work in each grade in the best schools all over the country. They represent, fairly, the consensus of opinion of American educators who are particularly interested in arithmetic in our schools.

Order of Topics.

One topic need not be finished before another is begun. In real life all sorts of experiences come to the child in one day. The idea of the work should be "spiral," that is, the same main topics should be carried on from year to year. As the child develops, so should the topics. At certain ages special attention should be paid to certain topics, and a definite and thorough study must be given them; but never should all the other topics be dropped in favor of the one under immediate study. For example, simple fractional relations, as ½, ⅓, etc., should be used from the very first, although the topic of fractions is dealt with most thoroughly in about the fifth grade. In the fifth grade, however, denominate numbers, which are emphasized before that grade, must not be dropped, but must rather be used in the fractional work itself. In this way arithmetic appears as a unity, not as a patchwork.

General Suggestions to Teachers. 1. Do not be deceived: the mind of your pupil acquires knowledge only by its *own* activity. You may talk till doomsday; you may "explain" until you are gray; the child learns to do by doing. The degree in which you have awakened his self-activity is the measure of your success. Even an ordinary teacher, if she works with this in mind, will find that her pupils soon "just love arithmetic."

2. Send for, or borrow, no matter what grade you may be teaching, some of the modern standard arithmetics, such as Meyer's, Southworth-Stone's, Speer's, or the like. They are full of valuable suggestions for you.

3. Always teach the process first, carefully, even slowly; then drill for facility. Do not think you can teach by drill. Drill, or training, comes after the process is understood thoroughly.

4. Arithmetic is truly practical when it deals with real things, with living problems. The child, for instance, should actually weigh and measure. How often we find children, or grown people, reciting glibly, 12 inches make 1 foot; 3 feet make 1 yard, without really having a definite idea of the distances. Let the child use his ruler constantly. He should estimate measurements and then verify his judgment by using his 12-inch ruler or his yard stick. Take the children on imaginary trips with friends, paying fares, for lunches, etc. Make market lists for provisions, clothing worn by children, and the like. Have the children who are old enough find the prices at first hand, and insist on accuracy. Place these lists on the blackboard for use in both oral and written work; they may be a basis for invention problems and for making many an arithmetic principle clear.

NUMBER IN THE HOME AND THE KINDERGARTEN.

In the home and in the kindergarten the little child is slowly emerging from the vague and indefinite in number relations to the exact and definite. Quite informally, but none the less surely, the mother or the kindergarten teacher may aid in directing this growth. Size—large and small; measurements—long, short, thick, thin, wide and narrow; weight—heavy or light; position, direction, etc., are all basic in number. As Froebel says, "The whole of arithmetic, and the whole teaching of number, is connected with the perception forms of the kindergarten." It is the business of those in charge of young children to present conditions that will appeal to and encourage the desire to count or measure or limit, in some way, and thus aid in the child's early development along number lines.

The home and the kindergarten teaching of number should be as follows:

(a) Rational counting—counting so that the number of objects is separate from the objects themselves in the child's mind.

(b) Ready recognition of number in groups of objects variously arranged,

(c) Number pictures, e. g., blocks, sticks, fingers, arranged to make it easy for the child to picture through sight, for instance, certain easy number facts, as

Suggestions. 1. When the mother takes her little one upon her lap, and plays baby finger-games, counting, as: "Four little birdies sat upon a tree. One

flew away and then there were three," suiting the action to the word, she is teaching number. To help the child in his learning to count, let the mother or the kindergartner give such exercises as the following:

How many fingers have you on one hand?
Shut one finger. How many are open?
Shut another. How many are open? How many are shut?

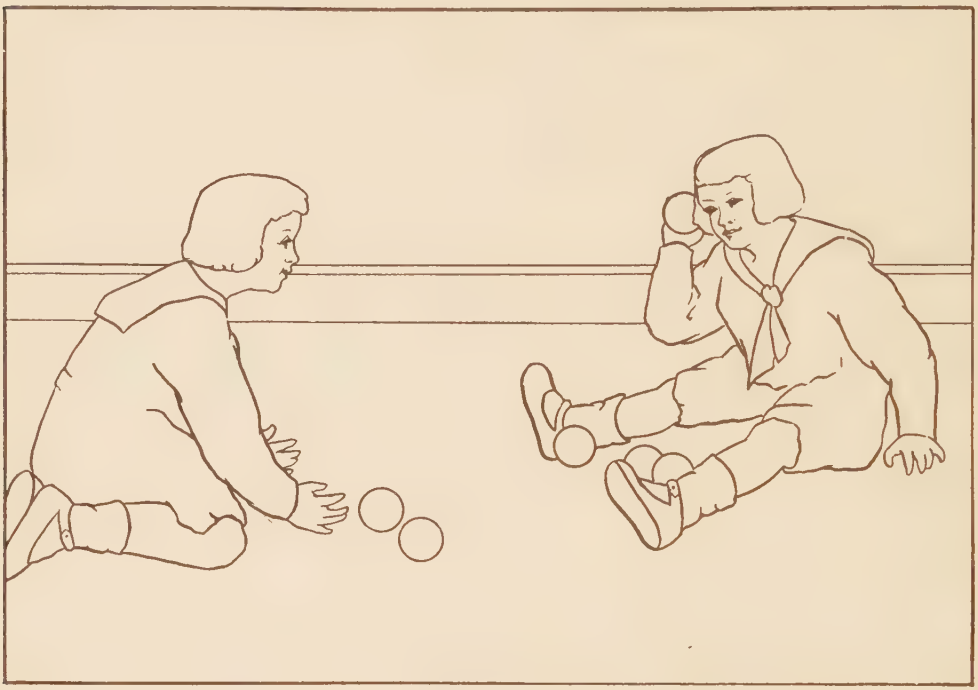
2. The mother, even without adding to her many duties, may be of service in her child's development, if she will frequently call attention to the number element in things. She may ask, "How many chairs do we set at our table?" or, "Pick out the largest buttons and put them into one pile, and the smallest into another, for mother," or "Give sister one of your three pennies; now how many have you left?"

3. The making of chains, stringing of beads, grouping of objects, all add to the growing number ideas. Encouraging the child to place his soldiers in two or three straight rows, or directing him to put the clothespins into the bag, two at a time, are ways of strengthening his number sense. When the father plays at dominoes with his little one in the evening, "matching" ends, he is not only entertaining, but teaching the child.

4. In the study of the gift-plays there are *number* opportunities at every turn. Tablets, point work, and especially the third, fourth and fifth gifts, lead directly to truths in number. The fifth gift is especially fitted for the very beginning work in fractions. The division of the tiny cube into one-half, or half of a half, makes it possible for the little child to see these relations. He plays he is a mason with four entire cubes to place as a foundation for his house, then builds more; perhaps he slips a rubber band about this group and places it as "one four" instead of four blocks. Then a rubber band (a rope to him) fastens *one* block with *one more,* and he hoists this until "the two" rest upon "the four."

He is really, without forcing, *seeing* that four and two are six, although he may not be able to say this. And so the building proceeds; in the taking apart of the blocks, more number relations are naturally discovered.

It would be a great mistake to force arithmetic at this point; it is only the recognition of the places where arithmetic naturally appears and should be emphasized, that is urged.



John and Tom are rolling balls.
When Tom gets the ball that John is about to roll, how many will he have?
How many will John have?
How many do they both have?

FIRST YEAR.

General Suggestions to the Teacher. In this year, number activities begun at home or in the kindergarten, such as (1) counting, (2) recognizing number in groups of objects, and (3) forming number-pictures are continued and developed. Beside this, number relations are shown through the measuring and making of simple things with the hands, by presenting little problems well within the interest and grasp of young children, and by teaching and training in the beginnings of reading and writing numbers.

Outline of Work for First Year.

1. Expression. The reading and writing of Arabic numbers to 100; Roman numerals to XII; fractional parts ½, ¼, ⅓; signs +, —, =.

2. Notation and Numeration. Processes. Numbers from 1 to 10, inclusive. The four operations should be taught through the use of objects; counting by ones and tens to 100; recognizing groups of objects without counting.

3. Fractions. Halves, fourths, thirds. ½ of 2, 4, 6, 8, 10; 1/3 of 3, 6, 9; ¼ of 4, 8.

4. Denominate Numbers. Cent, nickel, dime; inch, foot; pint, quart; day, week.

5. Measuring. This is really the basis of the year's work. Ideas of direction, size, form, should be continued and developed from the home or kindergarten work.

6. Living Problems. The problems in this grade, as in the later grades, should be based on the child's interests and experiences. Problems relating to the cost of *two* tons of hay may be apparently simpler, but are farther from the child's real comprehension than the cost of *five* toy balloons.

Helps on the Outline.

1. The teacher must be sure that the little ones in her care understand the meanings of the figures and signs before she requires their use.

Let the numeration come before the notation. Let the pupils see who can find and read the page numbers in their First Readers, first, as a game. Afterwards the figures should be used.

2. Train pupils to see instantly how many objects there are in a group of objects on the teacher's desk; in a group of marks on the blackboard, or on cards held up for the purpose.

Let the children, for seat work, make great numbers of inch squares, 2 x 4 rectangles, etc. They are useful as counters, as material to use in objectifying the four operations, etc. Skill, exactness in measuring, and neatness are all gained in this training work. Scraps of colored paper from the printer or stationer add to the interest in this work.

3. The simple fractional relations must be taught through the use of objects. Here is the place for quantities of simple paper folding and cutting, preceded by measuring.

4. Mother gave you a dime. You spent 5 cents for candy. What change did you get back?

The milkman left 1 quart of milk at your house this morning. The baby will drink a pint. How much is left?

Six inches melted from an icicle that was 1 foot long. Show with your ruler how many inches were left.

Make the denominate number work objective. Make many, many opportunities for actually measuring the inches in the foot on the board, or in construction; for counting out the five cents, in toy money, that make the nickel. Remember that much repetition is needed in this basic work.

5. Such terms as square inch, rectangle, triangle, circle, cubic inch, in connection with the form as it is used in class, should be used freely by the teacher, as the *definite* idea of form is growing in the child's mind.

Let children measure, measure, measure.

Examples: How long do you think your desk is? Use your ruler to measure.

How wide do you think the window pane is? Measure.

Show me a block this size; one twice as large. Find one only one-half as large.

Measure, fold, and tear this piece of wrapping paper into three-inch squares for paste dishes.

Cut these half-inch strips into 3-inch lengths for paste sticks.

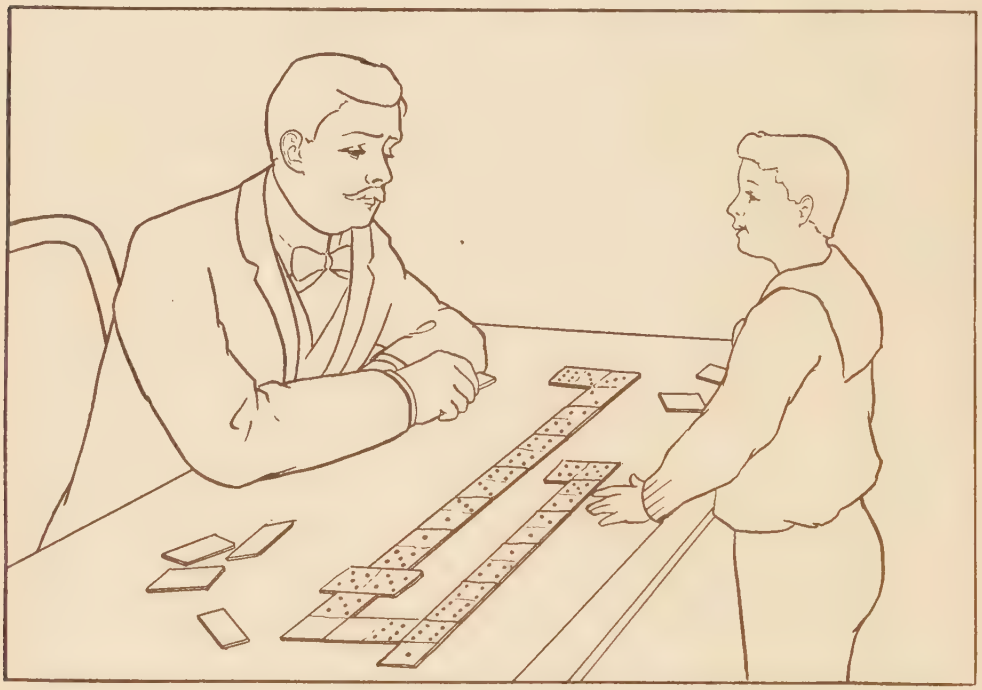
Suggestions for Materials.

As the work of the young child must be objective, a great variety and a great number of usable objects must be provided. Foot rulers, splints, counters,

such as shoe-pegs, corn, squares, and oblongs (made for seat-work by you or by older children); one-inch cubes; toy or "made" money; sets of cards for quick work, and (perhaps borrowed) a pint and a peck measure, are among the materials needed.

Make a set of pasteboard cards, about 6x5 inches, for teacher's use in quick work with children. On one card make a group of 3, on another of 4 large dots or solid squares that may easily be seen as the teacher holds the card before the class.

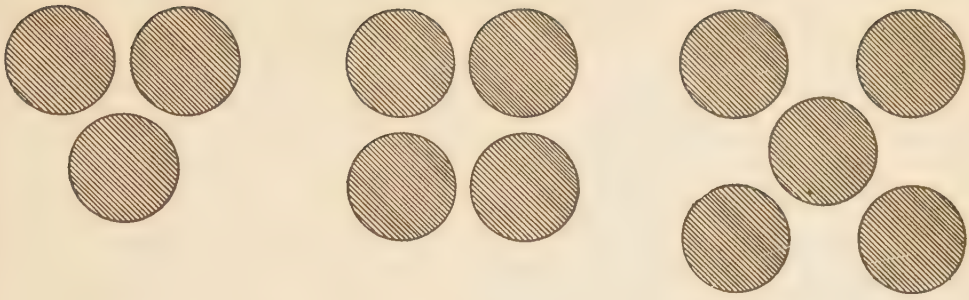
A set of scissors, or old scissors brought from home, together with flour paste kept fresh with a few drops of carbolic acid, have become a necessary part of the first grade class equipment. They make possible much seat-work in making things explained in class, as boxes, envelopes, etc.



Henry and his father are playing dominoes.
Do you think the game is about finished?
Why do you think so?
Who is going to win?
Find a domino with 7 spots.
Find one with 10 spots.
How many are there with more than 10 spots?

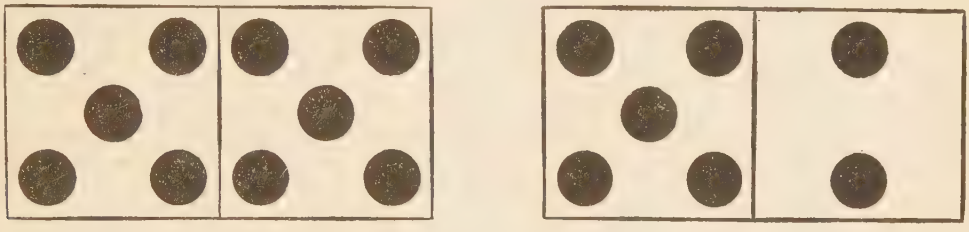
Devices for the Teacher.

Seeing in Groups. Use groups of colored circles, splints, etc.
Teacher: Tell me quickly, how many in this group of counters, Edwin.
Pupil: Three.
Teacher: How many in this, Nora?
Pupil: Three; no, four.
Teacher: In this other group, Nora.
Pupil: Four.



Teacher: Make groups of five of these pegs, Edwin; of four, Nora; of three, John, etc.

Dominoes for Arithmetic. Paper dominoes cut in large quantities from paper or cardboard by children, and dotted with brush and ink by the teacher, make good material for many number games.



1. Let the pupils "match" ends.
2. Select all alike.
3. Place in rows with a given number in each row.
4. Find one with ½, or 1/3, or ¼ as many dots as another.
5. Write on the board or on paper the number of dots on the dominoes.

Circle-Maker. With this simple tool young children can make circles of different diameters for various uses.

Have the children cut a piece of thin cardboard 4 inches long and 1 inch wide. Using your ruler, mark off each long edge in inches; then in half inches; then in quarter inches. Connect the marks. Write 1, 2, 3 and 4 in the inch spaces. Divide each short end into two equal parts with a mark. Connect the marks. The circle-maker is then made.

Stick the point of a pin through the circle-maker any place on the long central line where the short lines cross. Stick firmly into the paper on which

the circles are to be made. Stick the point of a pencil through the circle-maker on the long central line just one inch from the pin. Make the circle.

Ask the children what is its diameter. Then ask what shall be the diameter of the colored circles they expect to make for valentines.

Boxes for Stones, Seeds, Counters, etc. The material needed for this exercise will be thin cardboard or heavy wrapping paper.

The children should take the cardboard and draw a 4-inch square on it, then cut this out. Then have them place a dot 1 inch from each corner on each edge. Connect the opposite dots. Cut out the 1-inch square in each corner. Find the four little rectangles. Fold them inward. Take the little squares cut out and paste them across the open edges of the box. Then ask the children how long, wide and high the box is, and how many cubic inches it will hold.

SECOND YEAR.

General Suggestions to the Teacher. In this grade the children are really beginning, consciously, to form estimates and judgments of relative magnitudes.

There should be much oral work—work in which the child must first image the conditions, however simple, and then reason out the result, before putting the pencil to paper.

Outline of Work for Second Year.

1. Expression. Reading and writing Arabic numerals to 1,000; Roman numerals to L, if used in the Second Reader; reading and writing time from the clock; easy work in dollars and cents; signs, +, —, ×, ÷, =, $, c.

2. Notation and Numeration. Processes. (a) Simple addition and subtraction; numbers to be of not more than three orders.

(b) Tables through the 5's. Counting by 2's, 3's, 4's and 5's, using the tables stated.

(c) Simple multiplication and division, using tables learned; numbers to be of not more than three orders, each digit less than 6. Comparisons of numbers.

3. Fractions. Halves, fourths, thirds, and sixths.

4. Denominate Numbers. Cent, nickel, dime, quarter, half-dollar and dollar; inch, foot, yard; pint, quart, peck; time in hours, half and quarter hours, using clock; degrees, using thermometer.

5. Measuring. Free measuring (using foot rule and yard stick) of parts of and entire objects in the room; elementary work in area, using rectangles made by pupils. Triangle changed to rectangle.

6. Living Problems. In this grade children are much interested in each other; comparative height and weight mean much to them.

We measured Minna, Carl and Anna. Minna was 3 feet 6 inches high, Carl was 4 feet 1 inch high, and Anna 3 feet 9 inches high. Who is the tallest? How much taller is Anna than Minna?

Encourage the making of original problems, like the above, involving one step only.

Often a problem of considerable difficulty is easily solved by pupils if connected with the work they love, as the following, correlated with nature work:

We find that the twig we measured grew 1¼ inches last year, and that this year it grew 2½ inches. How much more did it grow this year than last?

Types of Oral Problems. I know how many pounds of candy I have and how many boxes I wish to put it in. How shall I find how much I should put into each box?

You know the length of one side of a square. How can you find the distance around it? Make a picture and explain.

Helps on the Outline.

1 and 2. Playing store is a great delight at this age. Almost every bit of formal grade work can be done through playing store. With toy money, or money made by the children themselves, interesting things may be bought and sold, United States money read and written, "bills" added, change made, and problems suggested by the children, e. g., ribbon measured by the inch, yard, etc., and nuts by the peck, etc. Mothers, in particular, will find this an easy way of keeping up school work when the child is kept at home because of bad weather or slight illness.

In adding columns of three or more figures, do not allow the pupil to add one figure at a time. He should combine two consecutive figures and should finally give the result of three at sight. For example:

5
3
4
—
+

He should think first, 7; then 12, and, after training, should say 12 at sight.

3. The use of the clock face is apt here. The teacher may put the questions as follows:

"Show how far the hand travels in one hour; in ½ hour; in ¼ hour. If it it took you 15 minutes to walk to school, show what part of an hour it took."

4. The denominate numbers should all be learned by means of the real objects. As suggested, playing store and using the clock face are excellent devices "for making the real measures seem real. Then should follow the training or drill to make the facts stick." Ask the children what three pieces of money will make a quarter.

5. Actual measuring of things in the room, cutting and tearing of papers to a given size, for a given purpose, etc., form the basis of work in measurement such as can be done later without using the rule, because the thing is understood. Children should follow from the board written directions, after work has been done in class; as directions for measuring and folding papers for cornucopias, papers lanterns, number cards, etc.

Devices for the Teacher.

Quick Work Games. The second, third and fourth grade teachers can use a set of number cards in a great variety of ways. Let the children make of odd bits of cardboard, cards about 3x5 inches, as seat work. These the teacher may make into sets of number cards by writing numbers on them in a bold, clear hand, in ink. The teacher may use them for drills, as follows:

(1) The teacher holds up one before the class, so that all may see for an instant, then takes it down. She then calls on some pupil for the sum, difference, or whatever process was decided upon before showing the card. This must be done rapidly.

(2) The card may be given to the child who gives the answer correctly first, each child trying to get as many cards as possible.

(3) Score may be kept by a monitor of the number each "side" has given correctly.

Bird House. This should be drawn, enlarged, on the blackboard for work

in measuring. Pupils who estimate height, measure, width, etc , correctly may aid in coloring "our bird house" while attention is given by the teacher to those weaker in ability to measure.

Numeration. Have on hand sets of splints or toothpicks bound with rubber bands, one in one group, ten in the next, one hundred in the next, etc., beside many loose splints for children to group.

Teacher: Show me one splint. (Write "1" on the board.)

Show me ten splints. (Write "10" on the board.)

How many times as many in the second bundle as in the first?

Show me ten of the bundles of ten. (Write "100" on the board.)

This place (units) is for the ones; this place (tens) is for the tens; this place (hundreds) is for the hundreds.

Write the number that means 1 unit, 1 ten and 1 hundred.

Pick out 2 units, 2 tens and 2 hundreds from the bundles.

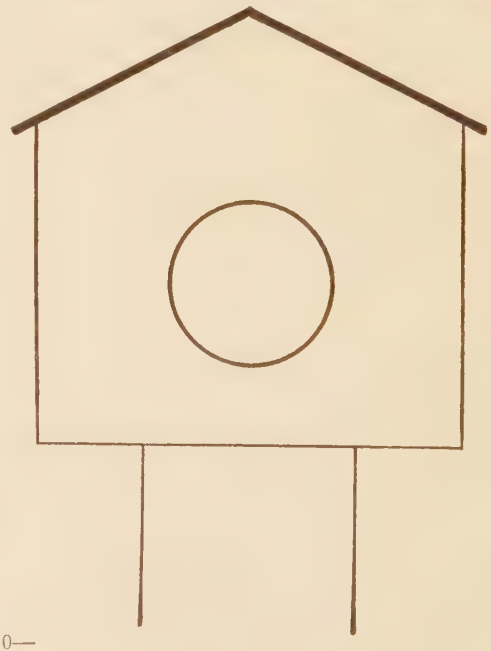
Write the number that stands for them, etc.

Using a string and crayon, draw a large circle, for the clock, on the board. Put in the Arabic rather than the Roman numerals at first. Mark the hours, half hours and quarter hours. Draw and erase the hands as they change position. The same drawing may be made for permanent use on a large sheet of cardboard; the hands may be loosely attached by a paper-fastener.

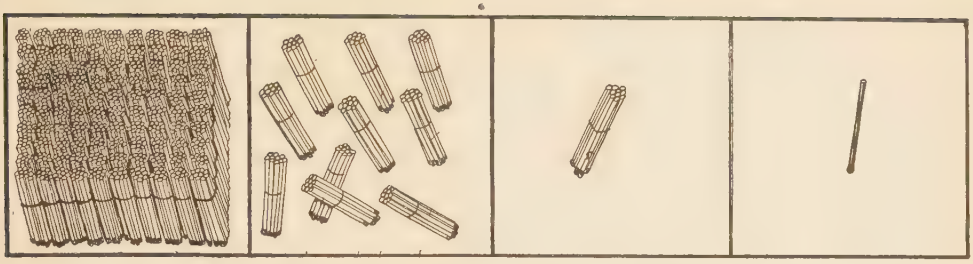
Let the children move the hands to time for school to begin, for noon, for school to close, etc.

When problems in time are given, or pupils are learning to tell time, have the little ones actually work with the thing; having the teacher point is not enough.

The clock device is an excellent one for illustrating points on simple fractional relations, comparisons of size, for pointing to in quick work in tables, etc. Once the principles are fixed, the object may be removed and used only in cases of doubt.

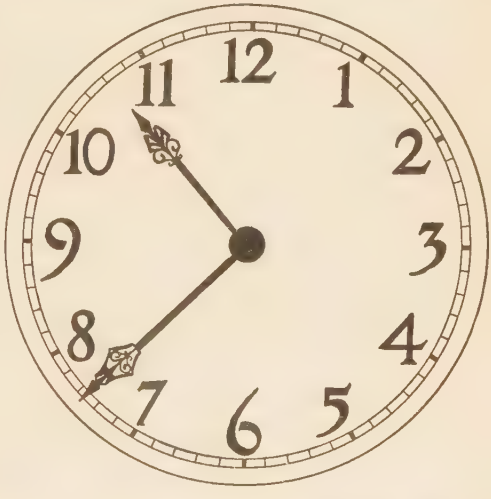


Directions for Making an Envelope. This may be made to hold language words, seeds, a letter, valentine, etc. The material needed is manila paper.



The children may cut (or tear) a six-inch square. Fold the square so that the two opposite corners will meet. With the base of the triangle toward you, fold the right hand corner to the middle of the base. Paste. In the same way fold the left hand corner. Paste. Fold the apex of the triangle to meet the middle of the base. Open. Then fold and paste the inner triangle to the middle of the base. Now tell them that since they have made this envelope so well with help, they may make one without assistance for seat work.

Such directions as the above may be written on the board with each step numbered as the children proceed. It may be left for the pupils to follow, by themselves, as soon as they are skillful enough to be left alone to carry out directions. The values in the work will appeal at once to the thoughtful teacher.



TYPE LESSON.

Reading the Thermometer.

This lesson is based on the use of the thermometer and is for the purpose of training the children in counting by 2's and by 10's. A common thermometer, which the children have been watching, may be used. Draw a diagram of a thermometer on the board, showing the degrees and spacing.

Teacher: All find the figure 0 on the drawing of the thermometer on the board. Jane, find it on the real thermometer, or heat measurer. Ralph, show with your finger how far the mercury rises when there is one degree of heat to measure.

Pupil: This is one degree.

Teacher: Show how high it rises to measure 10°, 20°, 30°, 40°, Lena.

Pupil: This is 10°; this is 20°, etc.

Teacher: To what point has it risen today?

Pupil: To here, between 30° and 40°.

Teacher: How many spaces are there between the marks 30° and 40°?

Pupil: There are five spaces.

Teacher: Mark off on the blackboard drawing the space between 30° and 40°. Into how many spaces are you dividing it?

Pupil: I'm dividing it into five spaces.

Teacher: How many degrees between 30° and 40°?

Pupil: There are ten degrees.
Teacher: And how many spaces did we say?
Pupil: Five spaces.
Teacher: Then how many degrees must each space stand for?
Pupil: Each space stands for two degrees.
Teacher: Count by two's.
Pupil: Two, four, six, eight, ten.
Teacher: Call the first space 32°, the second 34°, and so on.
Pupil: 32°, 34°, 36°, 38°.
Teacher: Now read the temperature for today, exactly.
Pupil: 34°.
Teacher: Count aloud and show the spaces from forty to fifty in the same way.
Pupil: Forty, forty-two, forty-four, etc.
Teacher: Now we have all counted by two's in pretty large numbers. Read the large spaces on the drawing of the thermometer, Cora.
Pupil: 0, 10, 20, etc.
Teacher: You have been counting by ten's. This is the way to write them:

10×2=20
10×3=30
10×4=40
10×5=50
10×6=60
10×7=70
10×8=80
10×9=90
10×10=100

They mean 2 tens are 20; 3 tens are 30; 4 tens are 40, and so on. All read them. Now write them on paper at your seats.

THIRD YEAR.

General Suggestions to the Teacher. In this grade the child should be taught to keep before him these three questions that arise in solving every problem: What is given? What is required? What shall I do to get it?

Outline of Work for Third Year.

1. Expression. Reading and writing Arabic numbers of five orders; Roman numerals to C; fluent reading and also writing of fractions and of dollars and cents as used in this grade.

2. Notation and Numeration. Processes. (a) Rapid and correct adding and subtracting of easy numbers.

(b) Tables through the 12's. Counting forward and backward by 2's, 3's, 4's and 5's.

(c) Multiplication and division; multiplier and divisor to be 10 or less. Written seat work emphasized. Comparison of quantities continued.

3. Fractions. Halves, fourths, eights, thirds and sixths.

4. Denominate Numbers. Emphasize and continue denominate numbers as presented in grades one and two. Change denominate numbers to the next larger or smaller unit. Tell time by the clock to minutes.

5. Measuring. Make still further use of measuring of all kinds.

6. Living Problems. Let the problems be *children's* problems, interesting and full of meaning for them, not the problems of a grown-up.

Real problems in comparison arise, as: If 3 sheets of cardboard cost 5c., what is the cost of 6 sheets? Let the comparison of 6 with 3 precede the second step of the problem.

Jim and Harold kept a lemonade stand at a picnic. At 5c. a quart, what

did it cost to make 2 gallons of lemonade? What was their gain if they sold it at 4c a pint-glass?

Helps on the Outline.

1. In this grade especial attention should be given to neatness and accuracy in written work, as well as to the more exact oral expression of number facts. Make a point of praising attempts to shape figures well and to give results rapidly and accurately.

2. There is great delight at this age in "numbers." Make great use of number games in fixing number facts, especially the tables. As suggested later, great enthusiasm may be maintained, and drudgery forgotten, if the teacher will but enter, with the spirit of fun, into the work on tables, as games in which all may compete. However, before rapidity or fluency in them is demanded, the number facts must be well taught.

3. Make use of the chart given and use the counters freely, allowing the pupils to show the relations in as many ways as possible. Encourage little original "number pictures" made by the pupils to illustrate problems.

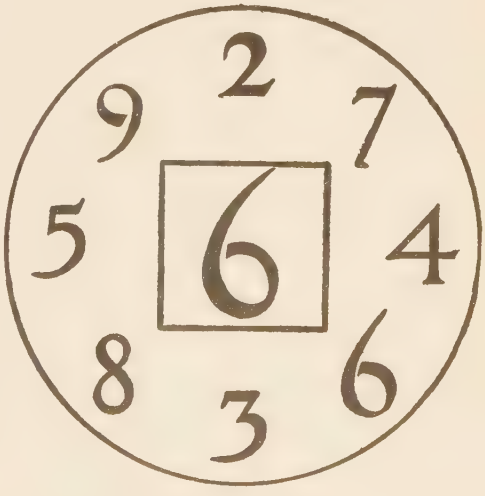
4. Make use of many problems, as: We have been in school, now, 1½ hours. How many minutes is that?

Fred is exactly 4 feet high. How many yards high is he?

5. Always follow this plan in measuring: (a) Let pupils estimate the distance or the quantity. (b) Measure, exactly. (c) Compare the measure with the estimate of it.

Devices for the Teacher.

"Table" Wheel. Make a large copy of the "Number Wheel" on the board.



This is one of the most interesting devices for training in pure number. It may be used in varied ways, as follows:

1. The teacher, using the pointer, says, "Give table of sixes, rapidly."

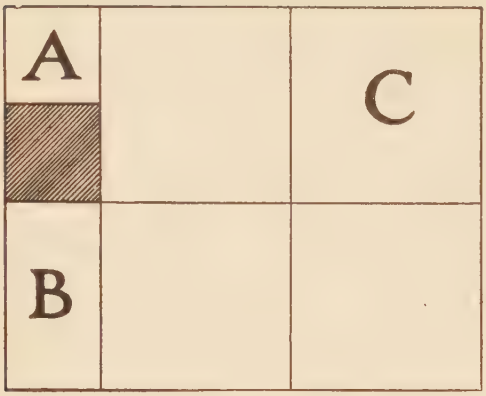
2. A pupil uses the pointer and chooses other pupils to answer.

3. Sides are chosen. The teacher, rapidly pointing, gives each side a turn in succession. One child may keep tally.

4. The central figure may be changed and the sign + placed on the board. Then tests may be given for correctness and rapidity. The pupils may write the results and rise when the work is finished.

Chart of Comparisons. An ingenious teacher will find such a diagram full of possibilities for training the eye to see, the mind to judge, etc. Comparisons are easily taught by its use. She may ask such questions, at last, as the following:

Which line is twice B? Which two added make H? Which line is the difference between F and D? Call A 5; name the others. Call A 6, and name the others. (See diagrams, page 64.)



Fraction Chart. The teacher may make a large drawing of this chart, 2½ feet by 2 feet, for class work, and may direct the children to make the same on paper, 2½ inches by 2 inches. Then she may use it for illustrating problems involving fractions, or for making plain to the eye the relations in the first place.

The teacher may then ask such questions as the following: How many square inches in the rectangle? What part of a square inch is B? A? Into how many half-inch squares might you divide the figure? Into how many quarter-inches? etc.

The Addition Table. This may be used for home work. The following are the thirty-six combinations called the "Addition Table." The children in the third grade should be able to call the results at sight. Use this table for testing, or for home work for pupils who are backward in addition. Insist on prompt answers.

2	2	2	3	3	5	4	3	2	5	3	2
2	3	4	3	4	2	4	5	6	4	6	7
5	6	7	8	6	4	8	2	6	5	4	3
5	4	3	2	5	7	3	9	6	7	8	9
6	5	4	7	6	5	7	9	8	7	9	9
7	8	9	7	8	9	8	6	8	9	8	9

By placing any figure desired before those given, a great many pure number problems may be easily contrived by teacher or mother.

FOURTH YEAR.

General Suggestions to the Teacher. At this age there is a great interest in "team" work. The arithmetic teacher may take advantage of this by frequent "choosing up" for arithmetic matches for review work. Pupils will work, because of this social instinct, for their "side" in a number game, when the same material, presented as *drill* by the teacher, would awaken no interest.

Outline of Work for Fourth Year.

1. Expression. Reading and writing Arabic numbers to seven orders; Roman numerals to M; two orders of decimals, including the reading and writing of dollars and cents, decimally.

2. Notation and Numeration. Processes. (a) Work for exactness and rapidity in the four operations.

(b) Written words using the four operations with multipliers and divisors of two orders. "Long" division and "long" multiplication well begun. Comparisons extended.

3. Fractions. Further use of fractions learned in previous grades. Changing from fractions to whole or to mixed numbers and back again. Addition, subtraction and comparison of fractions.

4. Denominate Numbers. All denominate number tables used in other grades, completed and learned. Much work on problems involving denominate numbers.

5. Measuring. Measuring as noted in grades two and three should be extended. Application in drawing, making, etc., should be continued.

6. Living Problems. What are the dimensions of this room in yards? Find the area of the space on which your seat and desk stand.

Correlating this work with nature study, such questions as the following might be asked: Our weather chart shows that 15 of the 20 days were sunny and 5 were cloudy; what proportion of the days were cloudy? What proportion were sunny?

Helps on the Outline.

1. Give much training in the application of United States money, after showing that the business way of writing is merely a grouping of dollars, dimes and cents separately, *e. g.*, $50.73 means a group of fifty dollars, a group of seven dimes and a group of three cents.

2. It is a great stimulus to test each child by the clock for rapidity in performing certain operations. At the end of a week, test again to find improvement. During the study period occasionally ask the pupils, as part of the work, to watch the clock and test themselves for rapidity on the work you expect to require orally of the class.

Distinguish with children of this age between *division* and *partition*. Lead them, that is, to see the difference between $.15÷$.05=, and 1/5 of $.15=$.03.

Easy examples involving the four operations may be written on the board for the sake of training, then erased rapidly one at a time. The children should put down the answers only, exchange papers and correct.

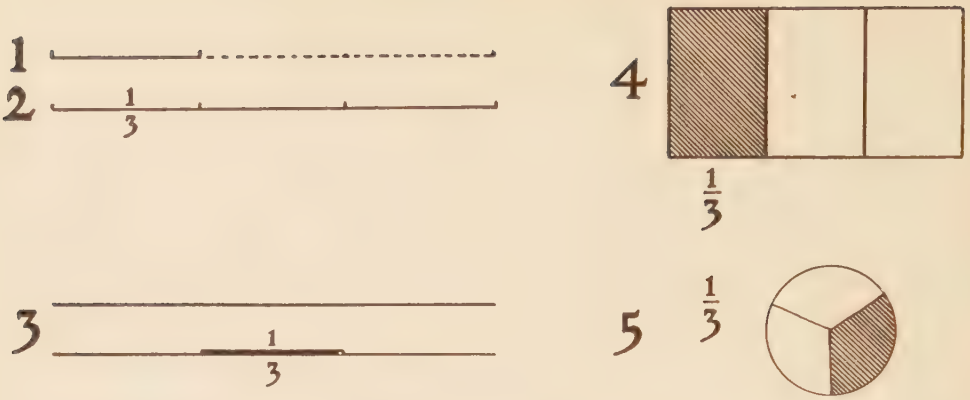
Examples:

88÷22 =
500—250=
60+17 =
50×5 =

3. Make sure that the child really grasps fractional relations by asking him, for instance, to show 1/3 in five different ways.

4. Let the children estimate the number of quires of paper used by all the members of the room in the year, and the price of it.

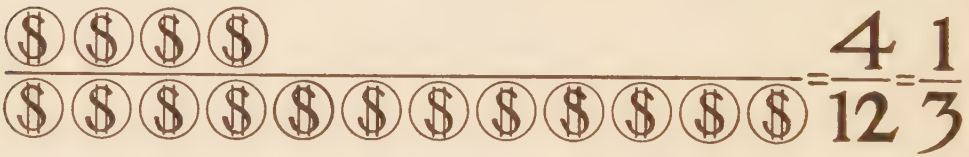
Let them figure on such problems as the length of a rectangular pane of glass in a school door if it is 19 inches wide and contains 665 square inches.



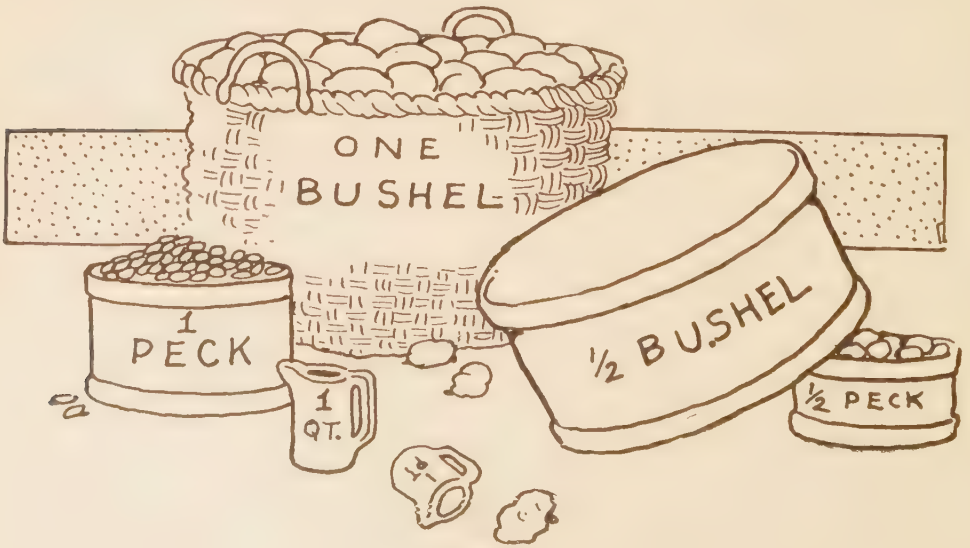
5. Have a square yard measured off on the floor by the children and used for comparison.

DEVICES FOR THE TEACHER.

Illustration of Original Problems. By this time pupils ought to be able to handle with ease examples with pure numbers. Yet illustrations can well be used by them to aid in explaining their own original problems. For written work,



ask the class to write out and to illustrate problems involving some point you have just made plain. For example, you have just reviewed certain work on fractions and wish the class to illustrate it by original problems.



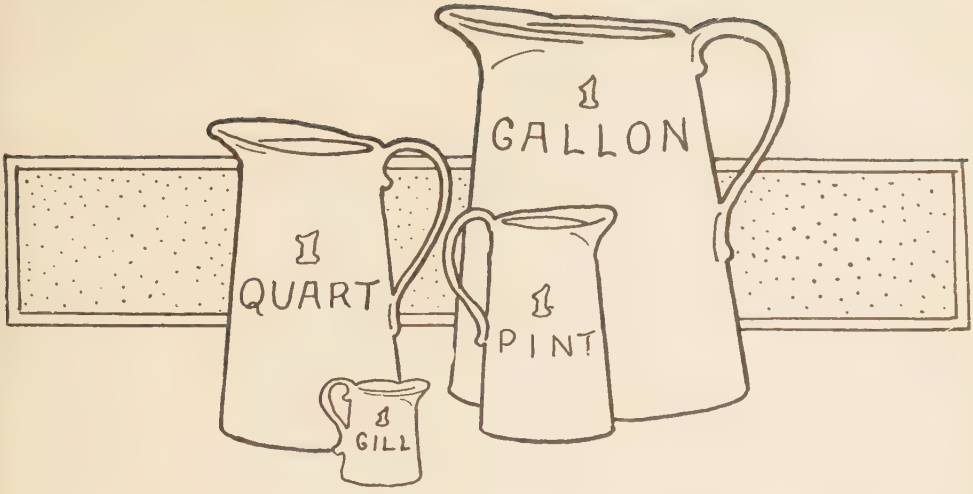


Illustration by pupil: I spent $4 of the $12 I had. What part of my money did I spend?

Denominate Numbers. Children should use the actual measures when dealing with denominate numbers. Much handling of the quart, peck or bushel is needed before the teacher can depend upon it that the glib reciter of the "table of dry measure" really images and understands what he is saying. Later, the objects should be removed, but if there is uncertainty, use the measures again.

The Division Table. This may be used for home work. It frequently happens that pupils in this grade have partially forgotten or are weak on their division tables. The teacher or parent will find here the principal points in division required. Where the child cannot give the result instantly, use toothpicks, marks, etc., and ask the child to divide the objects into groups.

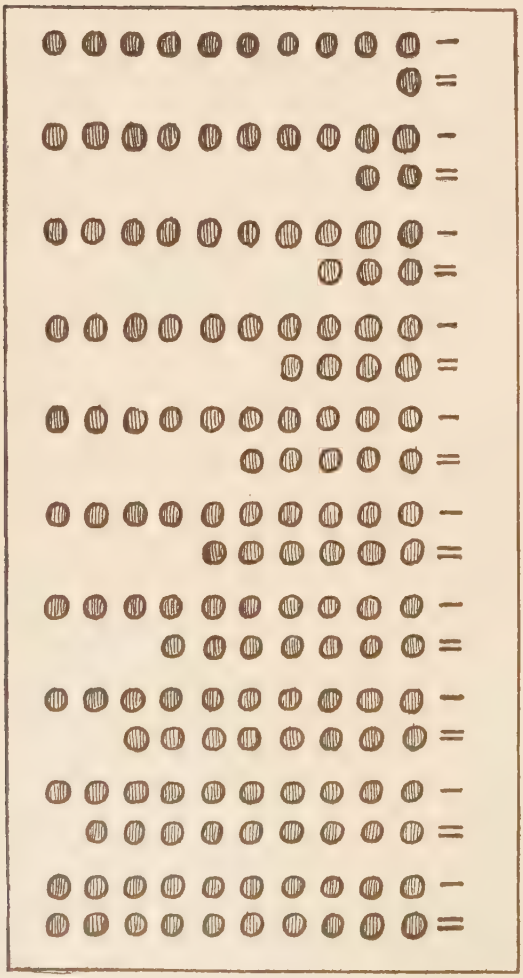
2)4	2)6	3)6	2)8	4)8	3)9	5)10
2)10	2)12	3)12	4)12	6)12	2)14	7)14
5)15	3)15	2)16	4)16	8)16	2)18	3)18
6)18	9)18	5)20	4)20	3)21	7)21	3)24
4)24	6)24	8)24	5)25	3)27	9)27	4)28
7)28	5)30	6)30	4)32	8)32	5)35	7)35
4)36	6)36	9)36				

Jessie Elizabeth Black.

Subtraction

SUBTRACTION.

- Definitions.
  - Remainder.
  - Minuend.
  - Subtrahend.
- Terms.
- Principles.
- Signs.
- Operation.
  - Like Numbers.
  - Grouping.
  - Subtracting.
  - Borrowing.
  - Remainder.
- Proof.
- Rules.



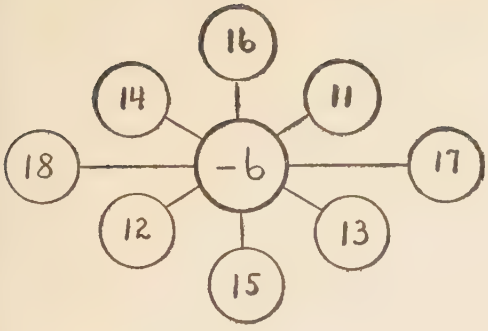
The charts on this and the following page show other schemes for drill in subtraction. They can also be used to equal advantage in addition.

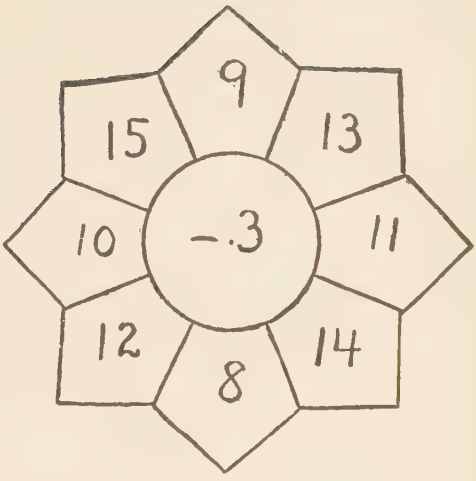
In a similar chart, under Addition, we show how interesting lessons can be made by using objects or pictures of objects instead of figures.

Rules and difficult terms and definitions should never be given to beginners, but when it is explained that subtraction is merely counting one number from another they are able to understand and remember the principles involved.

In the chart given the first two lines illustrate all subtractions in the table of ones, and by contrasting the chart on Addition with the one on subtraction, pupils will readily see the great difference in the operation.

After this chart has been thoroughly gone over the subtraction of figures will be an easy matter, as a glance at the chart will show that all the various subtractions up to 10 minus 10 are given.





The pupil that has taken the work in Addition in connection with the exercise here suggested can but appreciate the advantage of reciting the subtraction work in the same manner. The continual asking of questions by the teacher only creates confusion and occasions unnecessary noise, as the same results can be obtained by simply moving the pointer from one exercise to another. It begets order on the part of the pupil and not only makes the school work more effective but saves the teacher's breath for an occasion which demands it.

If this chart is before the class pupils may be called upon to recite as the teacher points to the different numbers on the outside row and pupils may recite in turn.

CHART EXERCISE.

The same scheme presented on the window roller with slated cloth, under Addition, can be used effectively with your beginning subtraction classes. Dozens of problems can be given which will include all the various subtractions. In the first few exercises we would give problems that would not require any borrowing and the other exercises can demonstrate this feature. The special advantage in having a chart of this kind is the saving of time on the part of the teacher in preparing the exercises every time she takes a class over such work. This temporary preparation is the thing that makes school work a burden to the teacher, and if these exercises can be put up in a permanent way so that they can be adapted for the various grades of work as reached, the teacher's work is not only effective but pleasant, and will proceed as clock work, thus giving a dignity which begets order and system. Carefully planned work, arranged for permanent use, is sure to yield better returns than hastily arranged, temporary work, and when prepared as suggested will not only give better returns but will eliminate the dust objection which results from the unnecessary use of the blackboard for such exercises.

10	11	14	8	10	9	8
4	7	8	7	2	5	2
12	13	11	6	9	12	7
3	5	6	2	4	6	3
7	11	9	12	8	6	7
2	8	3	7	3	2	5
6	9	13	10	8	9	12
5	7	7	3	4	6	5
11	5	10	12	15	13	14
5	2	6	6	7	6	8
10	8	14	11	13	16	15
2	6	9	7	8	9	6
12	14	16	15	13	14	16
9	6	8	9	4	7	7

The essential requirement for successful teaching of arithmetic is a constant drill on the fundamentals until the pupil masters the subject. We think if the teacher will prepare a chart as designed above and will have it in readiness that an opportunity will present itself frequently for its use. The pupils will especially appreciate drills of this kind, and the answers may be given in any direction without even using a pointer. The pupils may be called upon to recite rapidly and to continue until a mistake is made or the entire chart is covered. If the answers can be given readily to the problems here suggested, it will acquaint the pupil with subtraction and will be a drill which can be gone over profitably by many pupils considerably advanced in arithmetic. You can read from top to bottom, from bottom to top, from left to right and from right to left. In this practice, all that should be said or thought is simply the remainder.

DRILLS FOR WRITTEN WORK.

Write numbers that can be subtracted from 6 with remainders, as:

6—0=6
6—1=5
6—2=4
6—3=3
6—4=2
6—5=1

Write numbers that can be subtracted from 4 with remainders.
Write numbers that can be subtracted from 7 with remainders.
From 5 with remainders.
From 8 with remainders.
From 9 with remainders.

12— 6=6
12— 7=5
12— 8=4
12— 9=3
12—10=2
12—11=1
12—12=0

Make a table of numbers above 7 which can be subtracted from 15 with remainders.

Of numbers above 8, from 16, with remainders.
Of numbers above 5, from 14, with remainders.
Of numbers above 9, from 17, with remainders.
Subtract by 3's from 21. From 35 to 20.
By 2's from 20.
By 2's from 27.
By 4's from 36. From 23 to 3.
By 5's from 50. From 31 to 1.
By 6's from 54. From 38 to 2.

These drills will fix definitely in the pupils' minds that subtraction is counting one number from another and is, therefore, the opposite of addition.

PRINCIPLES IN SUBTRACTION.

I. Only like numbers, and units of the same order, can be subtracted.
II. The remainder is always like the minuend and subtrahend.

PROOFS OF SUBTRACTION.

I. The sum of the subtrahend and remainder should equal the minuend.
II. Subtract the remainder from the minuend, and the difference should equal the subtrahend.

NO CARRYING.

Practice is necessary, and problems easily understood are the most interesting drill to the pupil. For this reason it is well to give many problems requiring no "carrying," that he may become thoroughly familiar with the tables.

CARRYING.

If one step is learned at a time, confusion will be avoided. Master the tables before introducing the "carrying" process. A little at a time, mastered, results in interest, application and acquirement.

Multiplication

MULTIPLICATION.

- Definitions.
  - Multiplication.
  - Multiplier.
  - Multiplicand.
  - Product.
- Terms.
  - Factor.
  - Multiple.
  - Power.
  - Exponent.
  - Square.
  - Cube.
- Signs.
  - Meaning.
  - Name.
- Principles.
- Operations.
  - Written.
  - Partial products.
  - Proper position.
  - Adding.
  - Contractions.
- Proof.
- Examples.
- Tables.

The preliminary work in addition and subtraction fits the pupil for work in multiplication. As he learned the forty-five facts in addition and the various combinations in subtraction, he must now learn the multiplication tables.

A thorough knowledge of these tables is absolutely necessary. There are only a very few of these multiplications that give the pupils trouble, and these parts should be given especial attention.

Devices should be introduced so that the drills will not become monotonous.

SHORT WAY OF ADDING.

Show this principle by means of small numbers and make the applications to larger ones, and the value of multiplication is apparent.

PRACTICE.

Give many problems with small numbers until the pupil is thoroughly familiar with the idea. Problems within the understanding of the pupil are solved with delight and enable the pupil to familiarize himself with the tables without connecting the effort with the feeling of drudgery.

Multiplication Table.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

A very simple way of showing multiplication tables up to 12 is reproduced in the above illustration, and for the beginning pupil it might be well for him to have a card before him with such exercises thereon. It will serve to acquaint him with the results and will save time and wear on the book in turning back to the tables.

The teacher may insist that she does not believe in having the pupil refer to the tables, but such an argument can be offset by simply referring to the pupil's arithmetic and notice how readily it will open to the pages containing these tables and the worn appearance of this page. Our suggestion, however, is to use this card only temporarily until the combinations are all fixed in the mind to use it persistently in acquiring this information so that the pupils will not need to hold one finger on the multiplication table while they solve the problems in cube root.

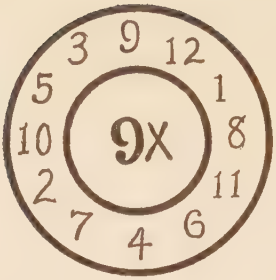
Exercises

We give below a few suggestive exercises to be used in connection with the study of the multiplication tables.

Have pupils prepare lists of the factors whose product will equal a given number, as

$2 \times 12 = 24$
$3 \times 8 = 24$
$4 \times 6 = 24$
$6 \times 4 = 24$
$8 \times 3 = 24$
$12 \times 2 = 24$

Have the class make a table of factors whose product is 60.
Whose product is 36. 72. 20.



The teacher can drill the pupils effectively on the tables by simply using the pointer, and a chart of this kind should be used in connection with every table. The essential thing in the mastery of these tables is drill, drill, drill.

REVIEW.

We give here illustrations of three diagrams to be used in connection with oral recitations on Addition, Subtraction and Multiplication. Should the pupils become familiar with the combinations the numbers can be easily changed and new combinations formed.

The figure in the center is combined with any number as indicated by the teacher, the answers being given orally and as rapidly as possible by the class.

Such exercises frequently given will aid the pupil in recognizing such combinations of figures at sight.

SHORT CUTS.

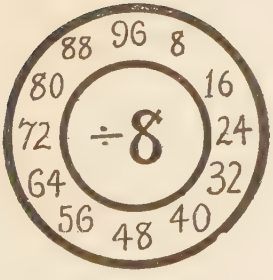
The introduction of short cuts in multiplication before the pupil thoroughly masters the tables and understands the principles involved, should be avoided, but it would be equally unwise later not to make use of this means for the saving of labor and the acquirement of rapidity.

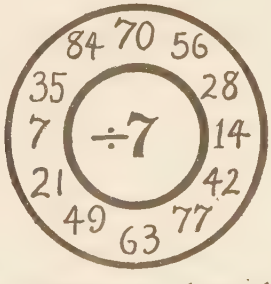
A thorough drill in the aliquot parts of 100 and 1,000 and the simple rules for multiplying by 9 or any number of 9's, the multiplying by 11, and other like rules, should be understood by the student in their application to multiplication.

Division

DIVISION

- Terms.
  - Dividend.
  - Divisor.
  - Quotient.
  - Remainder.
  - Prime Numbers.
  - Factors.
- Signs.
- Short Division.
  - Methods.
  - Rules.
- Long Division.
  - Definition.
  - Process.
  - Proof.
  - Rules.
- Factors.
  - Reduction.
  - Operation.
  - Rules.
- Cancellation.
  - Definition.
  - Method.
  - Signs.
  - Analysis.
  - Rule.
- Principles.
- Rules.
- Examples.





The teacher can use this drill in the same manner as those shown before. Various designs have been shown to lend variety to the exercise. The usual method of using the drill is by pointing to any number in the outside circle, asking the pupils to name the quotients for all the numbers involved in the drill, moving either to the right or left. Change the center number for each exercise.

Allow no "thinking out" results. The table must be at the tongue's end. Again, impress the importance of accuracy. A wrong result is worse than no result. The essential thing is to think quickly and to tell correctly.

A very interesting exercise can be had from a chart prepared as suggested in the illustration. In each of these exercises division is exact. We have prepared another chart on the following page which will show a remainder in the quotient. Of course, it is a very easy matter for these charts to be reproduced on the blackboard for temporary use, but as has been suggested, they will prove of so much value for reference and for ready class work that if the teacher can prepare permanent charts of this kind it will not only be a relief but will be used often when time will not permit the elaboration of such material on the blackboard and the confusion of the preparation and annoyance of the dust can be eliminated. Accuracy and rapidity in division are determined largely by the pupil's ability to give quotients at sight, and if this exercise is frequently used it will prove fascinating and educational.

6|16 3|17 5|29 7|18 4|13 9|21 8|31

2|25 5|22 9|87 4|23 6|58 3|20 7|30

4|33 7|37 3|28 8|36 9|40 2|33 5|43

7|44 9|55 8|85 3|17 5|37 4|46 6|41

9|91 4|26 6|15 5|49 8|52 7|60 3|28

5|67 8|79 4|47 9|66 7|83 6|57 4|49

8|76 2|31 7|74 6|68 3|35 5|62 9|75

For recitation have the pupil's announce at sight quotients and remainders.

The division on these two pages is done mentally, and the process is called short division.

Drudgery is to be avoided in school work. In all our various exercises the idea is to repeat the tables over and over again, and the object in having a great variety of these exercises is to give a pleasing nature to the work.

At no time are we sure that the pupil remembers the work previously recited, and for this reason it is necessary to review constantly, as well as to drill. A gradual growth, avoiding confusion, and repetition of past principals until thorough in their application, is necessary at every step.

SOME ORAL EXERCISES IN DIVISION.

How many feet in 60 inches?
24 inches?
96 inches?
44 inches?
52 inches?
120 inches?

How many quarts in 16 pints?
22 pints?
30 pints?
36 pints?
48 pints?
28 pints?

How many weeks in 49 days?
63 days?
35 days?
42 days?
56 days?
84 days?

How many quarters in $1.50?
.75?
2.25?
3.00?
1.25?
2.75?

What is 2-7ths of 49?
21?
63?
35?
56?
84?

What is 3-5ths of 30?
45?
15?
55?
25?
60?

How many nickels in 65 cents?
40 cents?
35 cents?
60 cents?
75 cents?
45 cents?

How many yards in 15 feet?
20 feet?
33 feet?
27 feet?
36 feet?
21 feet?

How many dozen in 60?
84?
72?
108?
96?
48?

How many dimes in $1.20?
.60?
3.00?
2.50?
.70?
1.00?

What is 5-8ths of 16?
40?
32?
48?
24?
64?

What is 4-9ths of 36?
27?
45?
72?
18?

LONG DIVISION.

Long division differs from short division simply in writing the products instead of performing the operation mentally.

A careful drill on easy problems will enable the student to familiarize himself with the process, and the introduction, step by step, of each new feature, will be easily effected.

EXERCISES.

Any number ending with an even digit is divisible by 2.

Any number is divisible by 4 when the number expressed by the last two figures is divisible by 4.

Any number ending in 0 or 5 is divisible by 5.

Any number is divisible by 3 when the sum of its digits is divisible by 3.

fractions

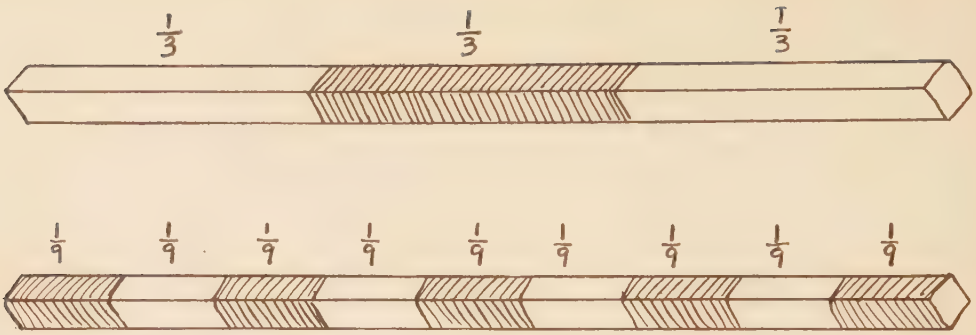
FRACTIONS.

- Kinds.
  - Common.
  - Decimal.
- Forms.
  - Simple.
  - Compound.
  - Complex.
- Value.
  - Proper.
  - Improper.
  - Mixed.
- Terms.
  - Numerator.
  - Denominator.
  - Integers.
  - Prime.
  - Composite.
  - Least Common Multiple.
  - Greatest Common Divisor.
- Operation.
  - Addition.
  - Subtraction.
  - Multiplication.
  - Division.
  - Ratio.
  - Reduction.
- General Principles.
- Rules.
- Examples.

By the use of objects pupils will readily grasp the idea of halves and thirds and by careful presentation they will see that 1/3 is smaller than 1/2. After these relations have been developed in the child's mind it is quite another thing to teach him the expression of these parts with figures and the mathematical combinations. This should be developed gradually. No guessing results should be permitted; no special emphasis laid upon rules, but a careful expression of the known in the symbols of the unknown.

Quite a few suggestive exercises have been shown and suggestive drills given With such help and the use of objects, pupils should not only learn to get answers but to understand the subject fully.

We stated in the study of the fundamental operations that a thorough understanding of them would enable the pupil to handle the more advanced operations successfully, and it is now opportune to emphasize the necessity of a thorough understanding of fractions in order to hope to be efficient in the understanding of percentage and the subjects to follow.



The above illustration can be used in developing the fractions 1/3 and 1/9 and shows, at the same time, their relative value to the whole number and to each other.

We give a few exercises of the many which can be developed by this device:

1/3 is equal to how many 9ths?
2/3 equals how many 9ths?
1/3+1/9 equals how many 9ths?
2/3 is how many more than 5/9?
Which is greater, 4/9 or 1/3?
2/3+7/9= how many 9ths?
6/9= how many 3rds?

6 5/9	26 8/9	6 1/3	30	14 2/9
1 1/3	— 7 2/3	2 2/9	— 7 4/5	6 2/3
		1 4/9		

RULES FOR REDUCTION OF FRACTIONS.

We give below a few rules in the reduction of fractions:

When both the denominator and the numerator are multiplied by the same number, the value of the fraction does not change.

When both the numerator and denominator are divided by the same number the value of the fraction does not change.

When both numerator and denominator are numbers which are prime to each other the fraction is reduced to its lowest terms.

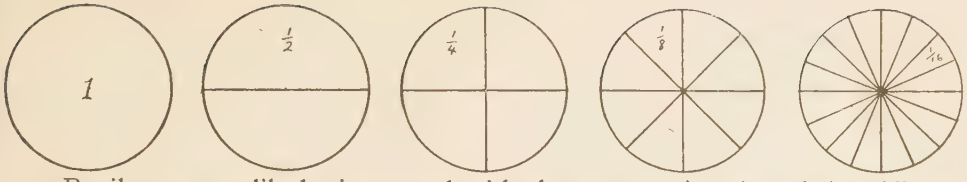
Fractions are reduced to their lowest terms by dividing both numerator and denominator by their greatest common divisor.

Fractions are changed to higher terms by multiplying both numerator and denominator by the same number.

An improper fraction is reduced by dividing the numerator by the denominator.

In expressing fractions the essential thing is to have the child understand that there are two questions presented, and to determine which part of the fraction answers each.

1. How large are the parts?
2. How many parts are taken?

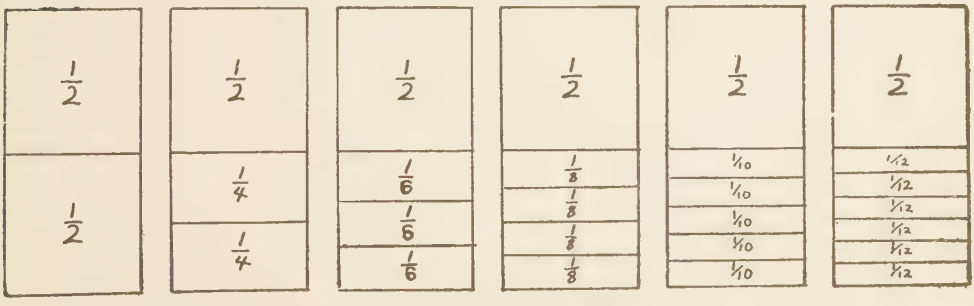


Pupils may readily be impressed with the comparative size of the different fractions by exercises as suggested above. They can easily see that there are two halves in one; that it takes 4/4 to equal one and 8/8 and 16/16. Since the teacher understands these facts she should not pass over them too rapidly, but many easy exercises may be developed, showing just how many 16ths in 1/8, in 1/4, in 1/2.

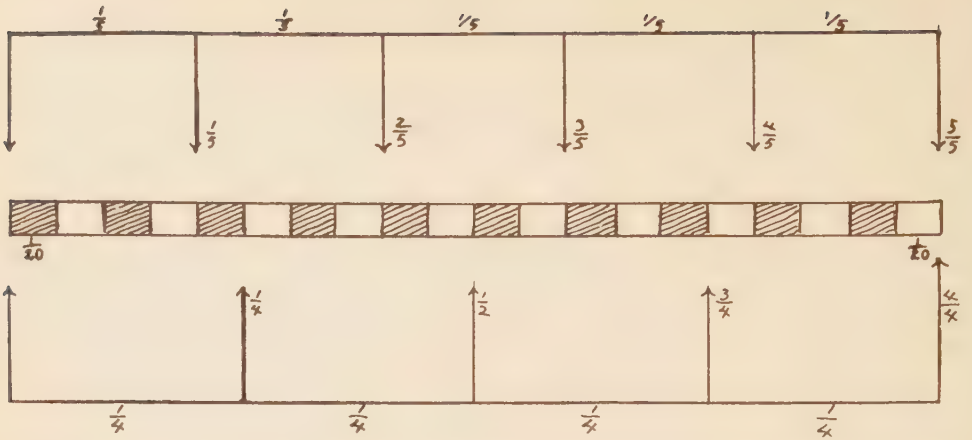
How many 8ths in 1/4? In 1/2?
How many 4ths in 1/2?
Various other questions may be asked, such as
How much larger is 1/2 than 1/4?
How much larger is 1/4 than 1/6?
How much larger is 3/4 than 5/8? 3/8?
3/8 is equal to how many 16ths?
6/16 is how much larger than 1/4?
3/16 is contained in 6/8 how many times?

EASY EXERCISES.

1/2 +1/4	1/4 —1/8	1 1/8 +2 1/4	1/2 —3/8	5 1/4 +2 5/8
7 1/2 —3 1/4	5/8 +1/4	3 1/16 —1 3/8	3/16 +5/8	4 3/4 +1 1/8
6 3/8 +2 5/16	9 1/2 —5 3/4	3 7/8 +1 13/16	15/16 +1/4	3 5/16 —1 7/4
27 +3 7/8	34 7 11/16	57 5/8 —4 6/16	23 3/8 9 1/4	21 3/4 —14 1/2



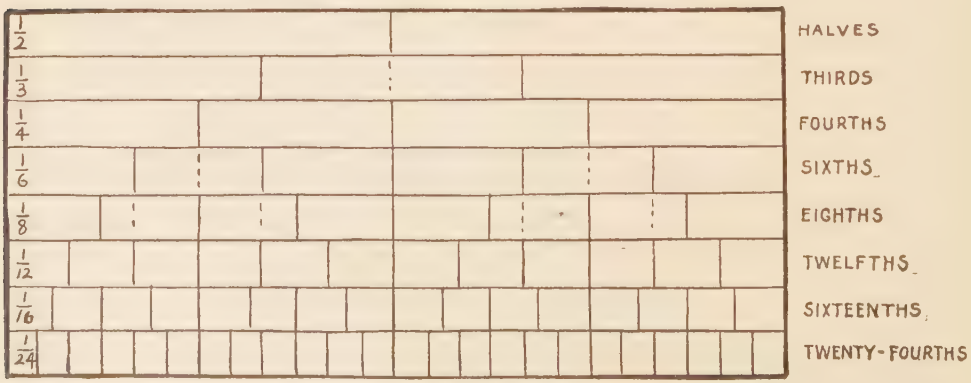
Have fourths compared with thirds, eighths, tenths and twelfths.
Story problems should be used freely to illustrate and make plain.
Every step should be illustrated with objects or drawings. Cardboard disks can be easily supplied.



The above diagram is divided into 20ths and will be found useful in teaching fractions and reduction. We give the following suggestive examples and the teacher can develop any number of similar exercises.

1/5 equals how many 20ths?
1/2 equals how many 20ths?
How many 5ths in 16/20?
3/5 equals how many 20ths?
1/4 equals how many 20ths?
1/5 equals how many 20ths?
1/4 is how much larger than 1/5?
1/2 is how many 20ths?
3/5 is how many 20ths?
How many more 20ths in 3/5 than in 1/2?
Which is greater, 4/5 or 3/4? How much?
Since 5 is larger than 4, why is not 1/5 larger than 1/4?

6 2/5	9 1/4	20 4/5	39	6 1/2
—4 1/2	—6 3/5	—7 1/4	—8 2/5	—3 3/4
14 1/5	7 9/20	13 3/5	16 3/4	1 17/20
—7 3/4	—4 3/4	—6 7/20	—3 4/5	—3/4



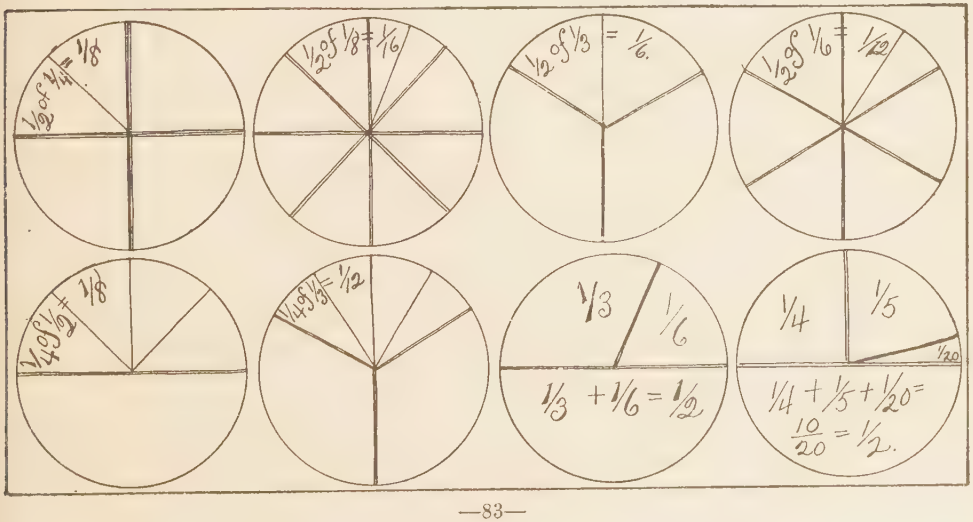
The illustration given below gives the different stages in the reduction of fractions. This enables the pupil to tell at a glance how many twenty-fourths are equal to one-eighth; the number of sixteenths in one-half, etc., and from closer study fix definitely the relative size and value of the fractions contained in the unit or whole number.

We suggest, in connection with this illustration, that the teacher write exercises on the board reducing to lowest terms such fractions as

72/128 63/90 96/144 90/105

Many examples can be made from this diagram comparing in size the different fractions found in it. We give a few to illustrate:

Change 3/6 to 8ths. 1/2 to 16ths.
Change 6/24 to 8ths.
What is 16 times the difference between 3/16 and 3/6?
What is 24 times the sum of 5/6 and 3/4?
What is 1/2 of 5/6?
What is the comparative value of 5/8 and 15/24?
How many 6ths in 1/2?
How many 16ths in 1/4?
How many 16ths in 5/8?
How many 24ths in 2/3?
How many 4ths in 9/12?
How many 3rds in 16/24?
1/2 is how much larger than 3/8?
2/3 is how much larger than 1/6?
5/6 is how much larger than 1/3?
How many 12ths in 1/3?
How many 24ths in 3/16?
How many 8ths in 3/4?
How many 16ths in 1/2?
How many 6ths in 8/12?
How many 16ths in 3/4?
5/8 is how much larger than 6/16?
3/4 is how much larger than 10/24?
1/4 is how much larger than 3/16?



Decimals

- DECIMALS.
  - Decimal Fractions.
    - Classes.
      - Pure.
      - Mixed.
      - Complex.
    - Operations.
      - Reduction.
      - Decimal point.
      - Addition.
      - Subtraction.
      - Multiplication.
      - Division.
      - Cancellation.
  - Percentage.
    - Fractional.
    - Equivalent.
    - Signs.
    - Value.
  - Circulating Decimals.
    - Definition.
    - Principles.
    - Reduction.
    - Operations.
  - General Rules.
  - Examples.

DECIMALS.

What has already been said in connection with the thorough understanding of the preceding departments of arithmetic should be again emphasized in the study of decimal fractions. We will content ourselves with an outline on this subject and by calling attention to an exercise in the development of the division of decimals, leaving to the pupil the development of the other subjects in decimals from the text book.

DIVISION OF DECIMALS.

It is foreign to the subject for a teacher, presenting division of decimals, to give lengthy problems in simple division. The one thing we learn at this time is to point the result correctly. So soon as the pupil has been drilled on the principles and solved the problems contained in the arithmetic, a simple exercise as suggested below will show very quickly whether the pupil understands thoroughly the "point" in question. A glance at the suggestive chart will show you that no technical division is required as the answer is merely 1 with the cipher prefixed or annexed. If your first thought is that the exercise is too simple for the pupils in your class we suggest that you submit it to them and you will be surprised at the result. Even your classes farther over in arithmetic will be confused with this exercise and many of them will not make over 50 per cent if given but a few minutes in which to make the division.

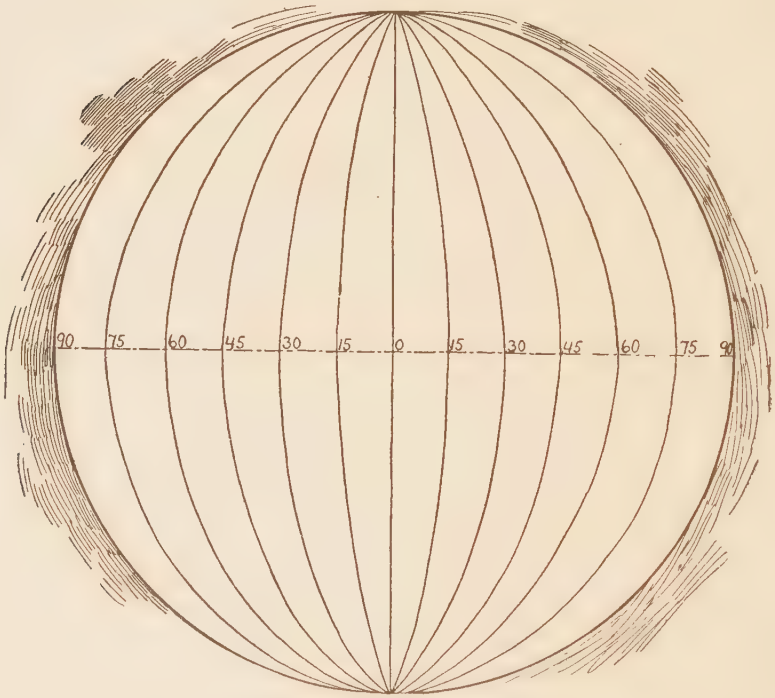
Teachers should be supplied with some sort of a duplicating machine, as they can be secured at a nominal price. A sufficient number of copies of this exercise can be prepared for class use. The teacher should prepare the answers before class time. The pupils should exchange papers and grade them while the teacher reads the answers. The entire exercise need not take ten minutes and will prove an eye opener to the class. We call especial attention to the fact that no two of the problems are exactly alike.

3)003	300)30	30)300	3)3
.03)3	3)300	300)3	.03)30
.003)300	30)3	.3)30	300)300
3)3	.3)03	.003)003	.03)3
30)30	.03)003	.003)3	003)30
300)03	.3)3	.03)03	30)003
.3)3	3)03	.300)3	003)3
.003)03	30)3	300)003	.03)300
3)003	.3)300	3)30	30)03

Longitude and Time

LONGITUDE AND TIME.

- Definitions.
  - Longitude.
    - How reckoned?
    - How measured?
  - Latitude.
- Signs.
  - Number.
  - Meaning.
- Operation.
  - Method.
  - Rules.
  - Principles.
- Examples.



LONGITUDE AND TIME.

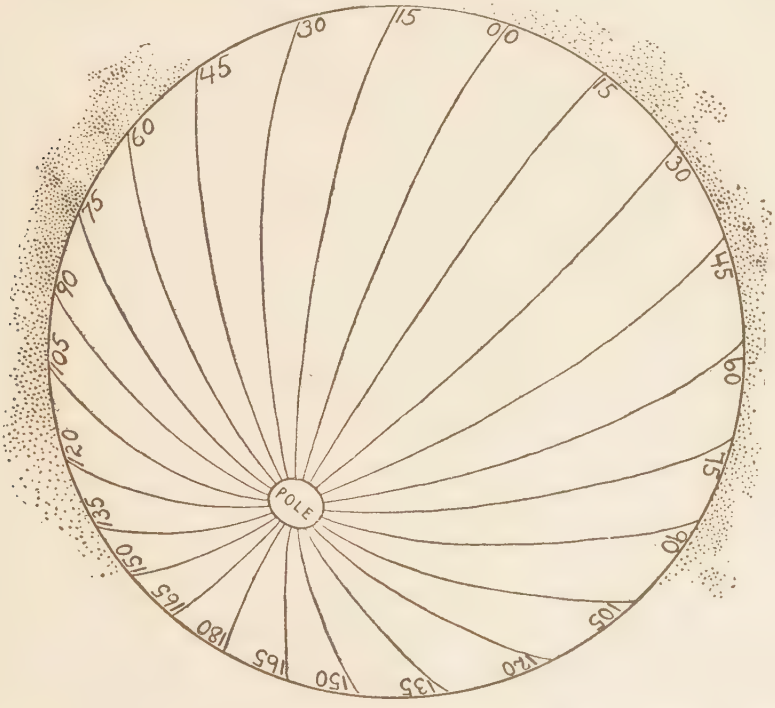
No teacher should attempt to explain Longitude and Time to the pupil without a diagram representing a hemisphere, and better than the ordinary representation of the hemisphere, would be a diagram showing the northern or southern hemispheres so that the entire circuit of the globe can be illustrated, thus showing the 360 degrees; and from this diagram it would be an easy matter for the teacher to develop the subject of Longitude and Time and the changing of the one to the other.

Since the degrees encircling the globe are 360 and the time it takes the earth to rotate on its axis is 24 hours, the simple division of 360 by 24 will

impress the pupil that every hour of time is equal to 15 degrees of longitude and since the divisions of the hours and longitude correspond in number and name we think any pupil will readily grasp the idea that to change longitude to time only necessitates a process of division, and to change time to longitude the reverse operation.

With the diagram above we suggest that the pupil be drilled thoroughly in the mental reduction of the one to the other. We have made this representation very simple since every meridian represents one hour of time and 15° of longitude.

A very few minutes' drill will enable the pupil to reduce to time the distance between 15° West longitude and 45° West longitude. This can be continued until you have made the half circuit of the globe. We should then reverse the operation by taking 15° West longitude and 15° East longitude and noting that it is necessary to add in order to find the difference in degrees, while in the previous problems it was a process of subtraction. We can then change the problem from 30° West longitude to 30° East longitude, continuing the addition process until the principle that East and West longitude must be added in order to find the difference is definitely fixed in the pupil's mind.



A degree of latitude in the Polar regions is about 69.3 miles in length, in middle latitudes about 69 miles and at the equator is 68.72 miles.

A degree of longitude is 69.16 miles long at the equator; 65 miles long on the 20th parallel; about 53 on the 40th; about 35 miles on the 60th and about 12 miles on the 80th.

Most countries have their own prime meridian of longitude; the one for the United States passing through Washington, while that of England passes through Greenwich. Longitude is generally reckoned from Greenwich, each degree of longitude being 1/360 of the earth's circumference.

The rotation of the earth once in twenty-four hours causes a difference in time of 4 minutes for each degree.

In Solar time there is a difference of 4 minutes for every degree east or west.

Eastern time in the United States is the sun time for the meridian 75 degrees west of Greenwich; Central time 90 degrees; Mountain time 105 degrees and Western or Pacific time 120 degrees. The time is one hour later for each belt from east to west.

The 180th meridian or International Date Line as it is called, is the line from which the day begins and the length of time taken by the sun to again reach that point constitutes a day.

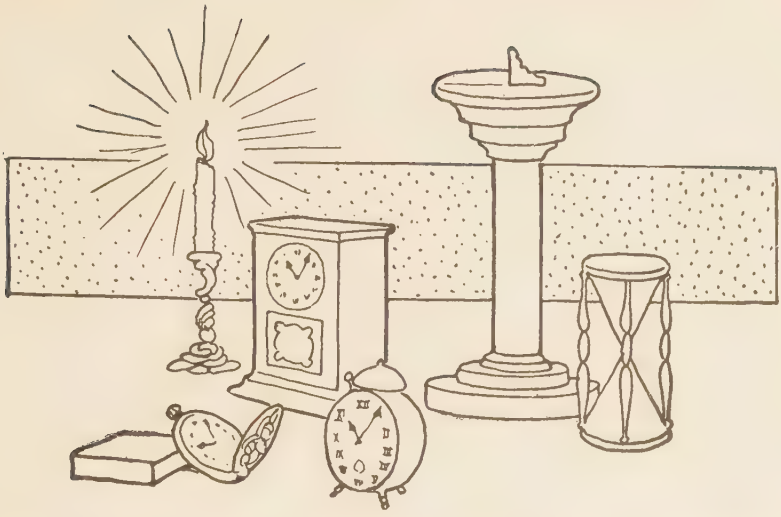
The day begins earlier as you travel east until the 180th meridian is reached and as you travel west an hour is gained for each time belt. Thus, in a journey around the world, from east to west, one day is gained and from west to east one day is lost.

The unit of time is one day. Our illustration shows various methods of measuring time and will prove an interesting and useful study for the beginning of the work in this department.

Time measure not only applies to the day and its divisions, but is used in the study of interest and in longitude and time.

The business month is ordinarily figured at 30 days and the business year at 360 days.

A solar year contains 365 days, 5 hours, 48 minutes and 51.6 seconds. All years divisible by 4 are called leap years, except centuries, which must be divisible by 400.



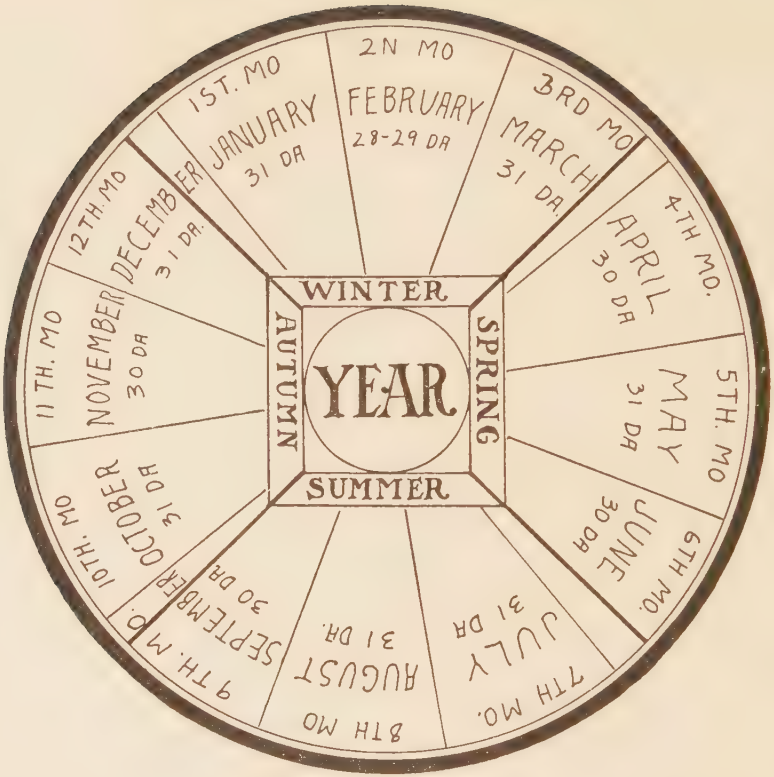
Calendars are so common that every child is familiar with them and can readily become interested in the study of them. In addition to this it is common now in primary schools for the teacher to have the calendar for the current month displayed on the blackboard. By making use of these means the pupil will readily become familiar with the days of the week, the months of the year and with the number of days in each month.

Various exercises can be conducted that will not only create an interest for the pupil but will be profitable as well. Pupils will be interested in finding out on what day of the week the next Fourth of July will occur or their respective birthdays, holidays, etc. The pupils should be led to distinguish between the day of the week and the day of the month and with the use of the diagrams shown they can readily acquaint themselves with the seasons, quarters, etc.

A FEW SUGGESTIVE EXERCISES.

How many weeks in a year?
How many days in a week? Name them in their order.
How many months in a year? Name them in their order.
How many months have 31 days?
On what day of the week does Decoration Day fall this year?
Is 27 days longer than 4 weeks?
Which is nearer the exact length of a month, 4 weeks or 5 weeks?
How many days in two weeks?
On what day of the week will your next birthday occur?

Remembering the addends of 7 and the day of the week for the first of the month, one can readily locate the present day of the month. This will be of much help to you and will frequently enable you to give the day of the month when you would otherwise be unable to do so. We are nearly always able to determine whether this is the second, third or fourth week of the month, knowing approximately the date. If we remember that the first day of the month was Monday and it is now Tuesday about the last of the month, we only need to repeat 8—15—22—29, and we know that Monday was the 29th and that today would be the 30th.



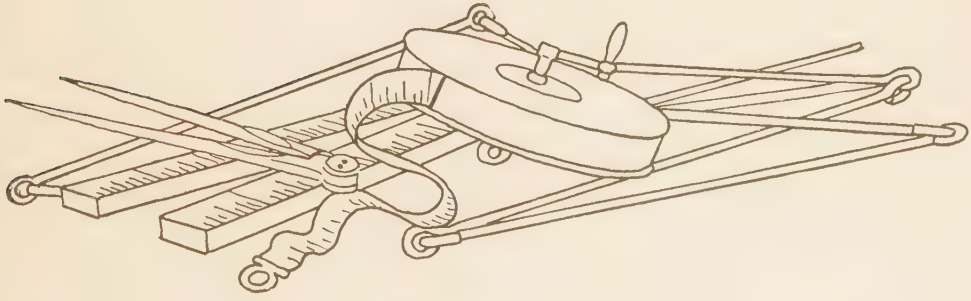
GREGORIAN CALENDAR.

The first division of time resulted from the changes of the moon, suggesting the months, and the movement of the sun and regular recurrence of the seasons, into years. The division into weeks was based on the Laws of Moses, setting forth every seventh day as a day of rest.

The Egyptians, the Jews, the Greeks and the Romans all had different systems of determining the seasons. The original calendar of the Romans was first remedied by Julius Cæsar and later Pope Gregory XIII reformed the Julian Calendar, making all years divisible by four leap years, with the exception of new centuries, not divisible by 400, as 1700, 1800, 1900, which, with all other years not divisible by four, are called common years.

ORIGIN OF NAMES OF MONTHS.

January	Janus	The god of the year.
February	Februa	Roman festival of expiation.
March	Mars	God of war.
April	Aperire (to open)	Budding month.
May	Maia	Daughter of Atlas.
June	Juno	Sister and wife of Jupiter.
July	Julius	In honor of Julius Cæsar.
August	Augustus	In honor of Augustus Cæsar.
September	Septem	Seventh month.
October	Octo	Eighth month.
November	Novem	Ninth month.
December	Decem	Tenth Month.



Surveyors and engineers usually measure with steel tapes generally 100 feet long, divided into feet and fractions of a foot.

A hand, used in measuring a horse at the shoulder, is equal to 4 inches. A span is equal to 9 inches.

A Gunter's Chain is 4 rods or 66 feet long and consists of 100 links.

A knot is equal to 1.15 common miles and is used in measuring distance at sea.

A square for measuring floors is equal to 100 square feet.

In order to survey a piece of ground it is first necessary to find some corner stick or rock from which to start. This being found, the line is then run according to an official chart until the particular subdivision is located.

The United States land measure, which is the same as that of England, is 4,840 square yards to an acre.

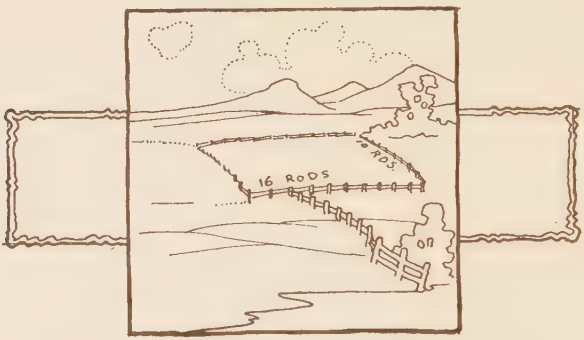
A Scotch acre is equal to 6,150 square yards; an Irish acre to 7,840 square yards; a French acre is equal to 11,960 square yards and an acre in Prussia is equal to 3,053 square yards.

To find the number of acres in a rectangular piece of land, multiply the length in rods by the breadth in rods and divide by 160.

To find the number of square rods in a triangular piece of land, if right-angled, multiply the width by the length and divide by 2.

To find what fractional part of an acre is contained in a town lot, multiply the length in feet by the width in feet and divide by 43,560.

1/8 of an acre equals a square of land 73 3/4 feet each way.
1/4 of an acre equals a square of land 104 3/8 feet each way.
1/3 of an acre equals a square of land 120 1/2 feet each way.
1/2 of an acre equals a square of land 147 1/2 feet each way.
1 acre equals a square of land 208 7/10 feet each way.



Dry measure is used in weighing such articles as grains, fruits and all articles not liquid.

Before weighing scales became common it was customary to use measures for this purpose.

Dry measure weights of different commodities are fixed by law in most of the states. A table for reference can be prepared and pupils should learn the weights used in their own state.

One bushel of grain is equal to 2,150.42 cubic inches.

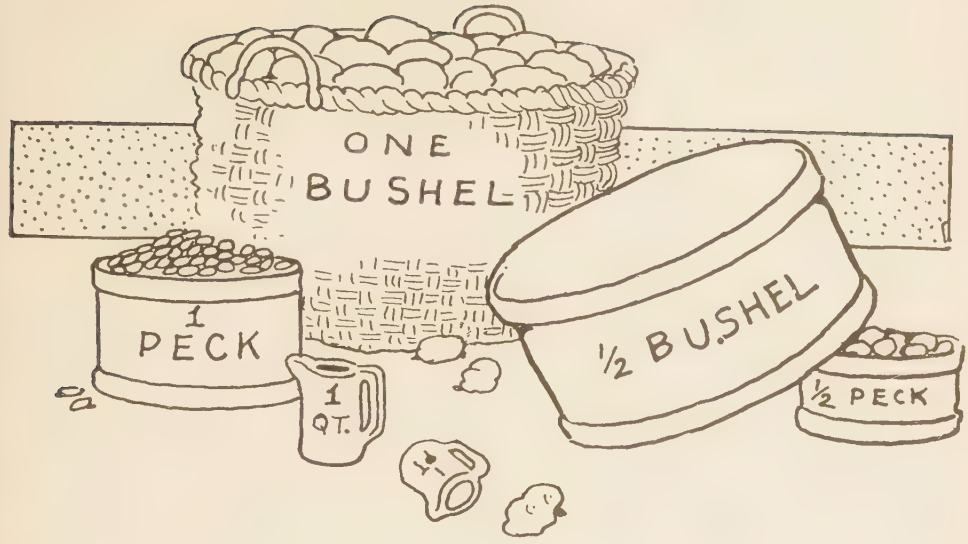
One bushel of vegetables is equal to 2,688 cubic inches.

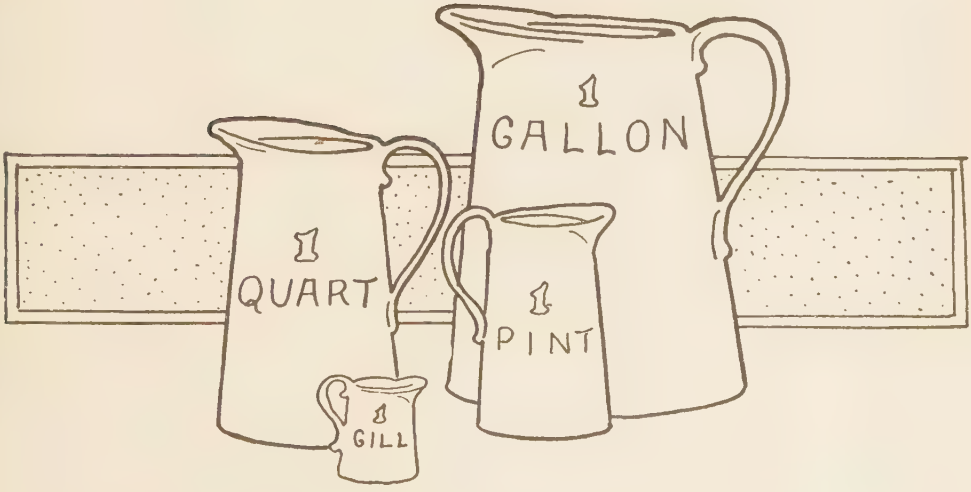
The legal bushel of the United States is the Winchester measure of 2,150.42 cubic inches, while that of England is 2,218.142 cubic inches, so that 32 English bushels are equal to about 33 of ours.

The number of pounds to a bushel varies in different states, some states measuring heaping bushels, which contain 2,815 cubic inches

Wheat, beans and potatoes weigh about 60 pounds to the bushel; shelled corn 56; oats 35 pounds; rye and flaxseed 56 pounds; corn on the cob 70 pounds, and buckwheat 52 pounds.

A bushel of corn means a bushel of shelled corn or ear corn enough to make a bushel when shelled.

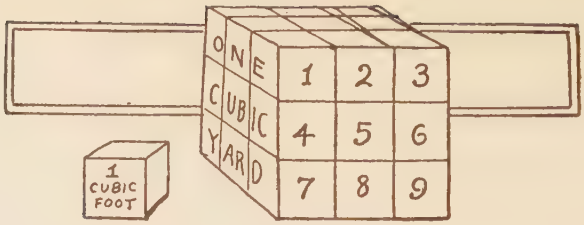




One gallon is equal to 231 cubic inches.
One cubic foot of water is equal to 62 1/2 pounds.
A teacup holds about 4 fluid ounces.
A tablespoon holds about 1/2 a fluid ounce.
A teaspoon holds about 1 fluid dram.

In taking up liquid measure, it is an excellent plan to have gill, pint, quart and gallon measures, where possible, and teach by actual demonstration in connection with the tables.

Commence with the gill and let the pupils see how many gills it will require to fill a pint measure, continuing in like manner with the other measures and at the close of the recitation have the pupils make a list or table from memory, based on the facts learned from observation. Have the children tell how many liquids they know of which are measured in this way.



CUBIC MEASURE.

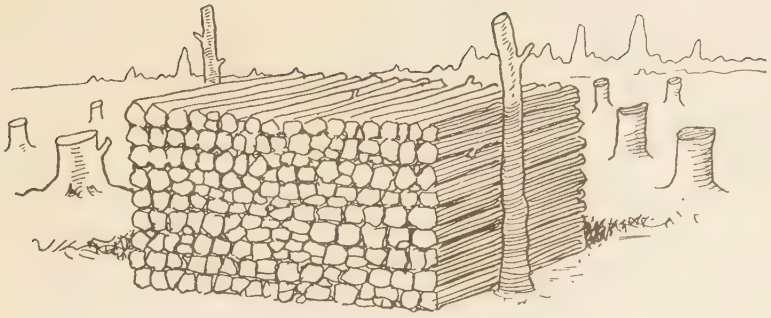
Every solid must have length, breadth and thickness. The use of objects is necessary for the successful understanding of this subject and should be constantly used to make every step clear. If the pupils have already made a thorough study of fractions and decimals, little attention need be paid to the mechanical operations involved. It is absolutely necessary for the pupil to commit tables and definitions, but this would be found a much more easy accomplishment by the use of diagrams like the one given above, which will readily illustrate the number of cubic feet in a yard and if objects and diagrams are freely used, the tables will be readily acquired and indelibly impressed on the mind.

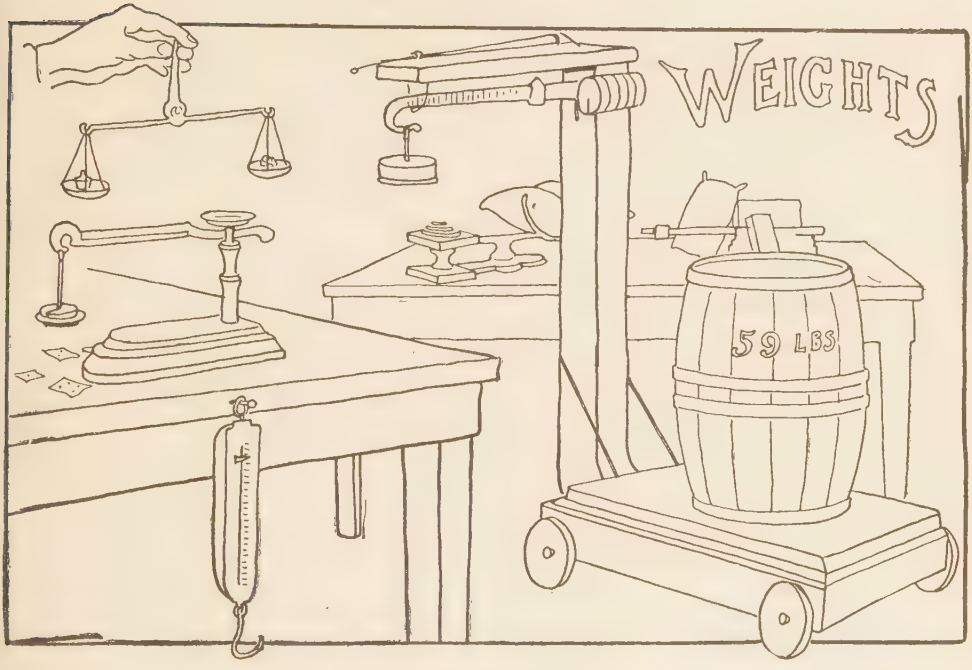
To find the number of cubic feet in a log, multiply 1/4 of the average circumference by itself and multiply the product obtained by the length, which will give the contents in cubic feet.

To find the number of cords of wood contained in a pile, multiply the length in feet by the height in feet and then by the width in feet and divide the result by 128.

A cord of stone will make approximately 100 cubic feet of wall.

Three bushels of lime and one cubic yard of sand will lay a cord of stone.





Distilled water is the unit by which the standard of weight is determined.

A long ton, which is used in weighing coal and merchandise in large quantities, is equal to 2,240 pounds.

One pound Avoirdupois weight equals 7,000 grains.

One pound Troy weight equals 5,760 grains.

A carat is used in weighing diamonds and is equal to 3 1/5 grains Troy weight.

The fineness of gold is also determined by the carat, the standard purity being .9 pure to .1 alloy, the alloy being of pure copper.

A firkin of butter weighs 56 pounds.

A barrel of flour weighs 196 pounds.

A barrel of beef or pork weighs 200 pounds.

A barrel of salt weighs 280 pounds.

A cask of lime weighs 240 pounds.

A keg of nails weighs 100 pounds.

A pint of water weighs about 1 pound.

Percentage

If the pupil has mastered the fundamentals and understands thoroughly common and decimal fractions it should be little trouble for him to take another step into percentage. It should not be presented as something vague, but a natural and simple relation of numbers expressed in so many hundredths and connecting with his previous work in fractions in such a way as to be readily understood.

TABLE OF EQUIVALENTS.

Symbol.	Written.	Decimal.	Common Fraction.
2 %= 2	per cent=.02	=	2/100=1/50
4 %= 4	per cent=.04	=	4/100=1/25
5 %= 5	per cent=.05	=	5/100=1/20
10 %=10	per cent=.10	=	10/100=1/10
11 1/9%=11 1/9	per cent=.11 1/9	=	100/900=1/9
12 1/2%=12 1/2	per cent=.12 1/2	=	25/200=1/8
14 2/7%=14 2/7	per cent=.14 2/7	=	100/700=1/7
16 2/3%=16 2/3	per cent=.16 2/3	=	50/300=1/6
20 %=20	per cent=.20	=	20/100=1/5
25 %=25	per cent=.25	=	25/100=1/4
33 1/3%=33 1/3	per cent=.33 1/3	=	100/300=1/3
50 %=50	per cent=.50	=	50/100=1/2

PERCENTAGE.

There are three kinds of problems in percentage:

1. To find the per cent of a number.
2. To find what per cent one number is of another.
3. To find a number when any per cent of it is given.

1. To find the per cent of a number such as 16 2/3% of 54, reduce the given rate of per cent to its equivalent common fraction (1 6) and divide the number by this fraction as—1/6 of 54 equals 9.

2. To find what per cent one number is of another, find what fractional part the percentage is of the number and reduce this fraction to its equivalent per cent, as—

What per cent of 300 is 50?

50 equals 1/6 of 300: 1/6 equals 16 2/3%

Or you can find 1% of the number and divide by the percentage, as—1% of 300 is 3. 50÷3 equals 16 2/3%.

3. To find a number when any per cent of it is given, find the equivalent value of the fraction and multiply by the denominator of the fraction, as—

Of what number is 630, 12 1/2%?

12 1/2%=1/8: 630×8=5040.

Or find what fractional part of the number is given, as—
1% of the number is 630÷12 1/2 or 50.4. 100% will be 50.4×100 or 5040.
Or divide the given number by the number denoting the rate of per cent, as—
450 is 10% less than what number?
450=90% of the required number. 1%=450÷90 or 5. 100% will equal 500.

	A	B	C	D	E	F
	3	74	13	8	.05	$21\frac{3}{4}$
I	$\frac{1}{2}$	.50	$\frac{2}{5}$	40	$\frac{3}{8}$	$.37\frac{1}{2}$
II	$\frac{1}{3}$	$.33\frac{1}{3}$	$\frac{3}{5}$	.60	$\frac{5}{8}$	$62\frac{1}{2}$
III	$\frac{2}{3}$	$.66\frac{2}{3}$	$\frac{4}{5}$	.80	$\frac{7}{8}$	$.87\frac{1}{2}$
IV	$\frac{1}{4}$	.25	$\frac{1}{6}$	$.16\frac{2}{3}$	$\frac{1}{12}$	$08\frac{1}{3}$
V	$\frac{3}{4}$	.75	$\frac{5}{6}$	$.83\frac{1}{3}$	$\frac{1}{16}$	$.06\frac{1}{4}$
VI	$\frac{1}{5}$	.20	$\frac{1}{8}$	$.12\frac{1}{2}$	$\frac{3}{16}$	$18\frac{3}{4}$

Or 450=9/10 of the required number. 1/10=1/9 of 450 or 50.
10/10 will equal 50×10 or 500.

The table given here can be used in any number of combinations and shows at a glance the decimal equivalent of the different fractions given.

One exercise can be given by multiplying the figures which are lettered by the figures which are numbered. For instance:

To multiply II by D, means that all figures in line II are to be multiplied by 8.

To divide IV by C means that all figures in line IV are to be divided by 13.

This can be used in subtraction and addition, and will be the basis of many interesting lessons in this important department of arithmetic.

After the pupil has studied the first exercises in percentage, we submit the following list of questions. It will be noted that there are but two numbers used in these problems. It will also be noted that no two problems are expressed exactly the same. If the pupils can perform these operations readily there is no question but that they understand the subject which they have been studying. If they cannot give these answers promptly it is only evidence that they need to give more time to the principles involved, and the more thoroughly these principles are mastered at the beginning of this subject the more readily will they grasp the various applications.

As in the division of decimals the all important feature was the point and not the review of the subject of division, so in percentage it is not important to review the fundamental operations but to understand the principles involved in percentage. We think this can be more easily accomplished by using simple numbers and in that way the fact can be emphasized.

SOME EXAMPLES IN PERCENTAGE.

What is ½% of 10?
What is 10 times ½%?
½ more than 10% is what?
½ less than 10% is what?
What per cent of 10 is ½?
How many per cent more than ½% is 10%?
½% is how many per cent less than 10?
10 is ½ of what number?
Of what does 10% equal ½?
10 is ½% more than what number?
What is ½% more than 10?
What is 10% less than ½?
½% is what per cent of 10%?
10% is how many per cent more than ½%?
Of what number does ½ equal 10?
What per cent of ½ is 10%?
10% is how many per cent more than ½%?
½ is 10% less than what number?
What number is 10 more than ½?
What is ½ more than 10%?
10% is ½ of what?
½% less than 10% is what?
10 times ½% is what?
10% more than ½% is what?
What is ½ more than 10%?
10% less than ½% is what?
Of what number does 10% equal ½%?
How many per cent less than 10 is ½?
10 is ½% less than what number?
What is 10% of ½%?
½ less than 10 is what?
What per cent of 10% is ½%?
How many per cent more than ½ is 10?
½% is 10 times what?
10% is ½ more than what?
What is ½% less than 10?
How many per cent more than ½ is 10?
½% of 10% is what?
½% is how many per cent less than 10%?
What is 10% more than ½?
Of what number does ½% equal 10?
½ is 10% more than what number?
10% is ½% less than what?
What per cent of ½% is 10%?
What is 10 more than ½?
½% is how many per cent less than 10%?
What is 10% of ½?
10% less than ½ is what?
½ more than 10 is what?
What is ½ of 10%?
10% is ½% of what?
What number is ½% more than 10?
½ is 10% of what number?
What is ½% of 10%?
What number is 10% more than ½?
What is ½ less than 10%?
10 more than ½ is what?
½% of 10 is what?
10 is what per cent of ½?
½% is 10% more than what?
What is ½% less than 10%?
½ of 10 is what?
What number is ½ more than 10?
½% more than 10% is what?
How many per cent less than 10% is ½%?
10 is how many per cent more than ½?
What is 10 times ½?
10% is ½ less than what?
½ is 10 more than what number?
What is 10% less than ½%?
10 is ½% of what number?
½ is what per cent of 10%?
½ is how many per cent less than 10?
10% more than ½ is what?
What per cent of ½% is 10%?
What is ½ of 10?
½% less than 10 is what?
10% is ½ more than what?
½% is 10% less than what?
Of what number does 10 equal ½%?
What is ½ less than 10?
10% of ½ is what?
What is ½ more than 10?
Of what number does ½ equal 10%?
10 is ½ more than what number?
10% is what per cent of ½%?
What is 10% more than ½%?
½ is 10 times what number?
What is 10% more than ½%?
What per cent of ½ is 10?
½ of 10% is what?
What is ½% more than 10?
10% is what per cent of ½?
10 is ½ less than what number?
10% of ½% is what?
½% more than 10 is what?
What is ½% more than 10%?
½ is what per cent of 10?
10 times ½ is what?
½% of 10% is what?
Of what does ½% equal 10%?
Of what number does 10 equal ½?

THE THOUSAND DAY METHOD.

The thousand day method of computing interest is simple, rapid and accurate, and applies to all interest problems. It is not a catch or a limited short cut.

PRINCIPLE. *The interest on any sum of money will exactly equal the principal in one thousand days at 36%.*

RULE. Multiply the principal by the number of days, and point off three decimal places in the product. The result is the interest at 36%. To find the interest at any other rate, take such a part of the interest as the given rate is of 36.

Therefore, to find the interest at—

3% ÷ by 12
4% ÷ by 9
4 1/2% ÷ by 8
6% ÷ by 6
9% ÷ by 4
1% = 6% ÷ by 6
10% = 10 × 1%
8% ÷ by 9 and multiply by 2

Problem: Find the simple interest at 9% on $248.58 for 2 yr. 2 mo. and 10 days.

Solution: 2 yr. 2 mo. 10 d. = 790 days.

$248.58
.790

2237220
174006

4)$196.37820 int. at 36%

49.09451/4 int. at 9%

Apply this rule in the solution of the problems below:

Find the interest on $885.50 for 7 mo. and 20 days at 7%.
Find the interest on $230.80 for 5 mo. and 12 days at 4 1/2%.
Find the interest on $1465.53 for 3 mo. 21 days at 9%.
Find the interest on $628.25 for 185 days at 4 1/2%.

THE BUSINESS METHOD.

The business method is the method usually employed in business houses.

RULE. Find the interest on the principal for one year at the given rate. Multiply this sum by the number corresponding to the number of years. This product will be the interest for the even years.

To the interest for even years, add such parts of one year's interest as are necessary to give the interest for months and days.

Problem: Find the interest on $450 for 2 years, 7 months, 18 days at 7%.

Solution:

Interest on $450, 2 yr at 7%=.14×$450, or	$63.00
Interest on $450 for 1 mo.=1/24 of $63, or $2.625	
Interest on $450 for 7 mo.=7×$2.625, or	18.38
Interest on $450 for 18 da.=18/30 or 3/5 of $2.625,	1.58
Interest on $450, 2 yr., 7 mo., 18 da., at 7%=	$82.96

Apply this rule in the solution of the following problems, then decide which method you prefer.

Find the interest on $840 for 1 yr., 9 mo., 15 da. at 7 1/2%.
Find the interest on $250 for 1 mo., 15 da. at 6%.
Find the interest on $372.50 for 36 da. at 8%.
Find the interest on $336 for 3 yr., 8 mo., 12 da. at 4 1/2%.

Involution

- INVOLUTION.
  - Definition.
  - Operations.
    - Squaring.
    - Position of figures.
    - Cubing.
    - Algebraic signs.
    - Illustrations.
    - Principles.
  - Terms.
    - Root.
    - Power.
    - Exponents.
    - Coefficients.

Evolution

- EVOLUTION.
  - Definition.
  - Symbols.
    - Signs.
    - Names.
    - Significance.
    - Geometrical.
    - Algebraic.
  - Square Root.
    - Definition.
    - Application.
  - Cube Root.
    - Definition.
    - How extracted?
    - Illustration.
  - Examples

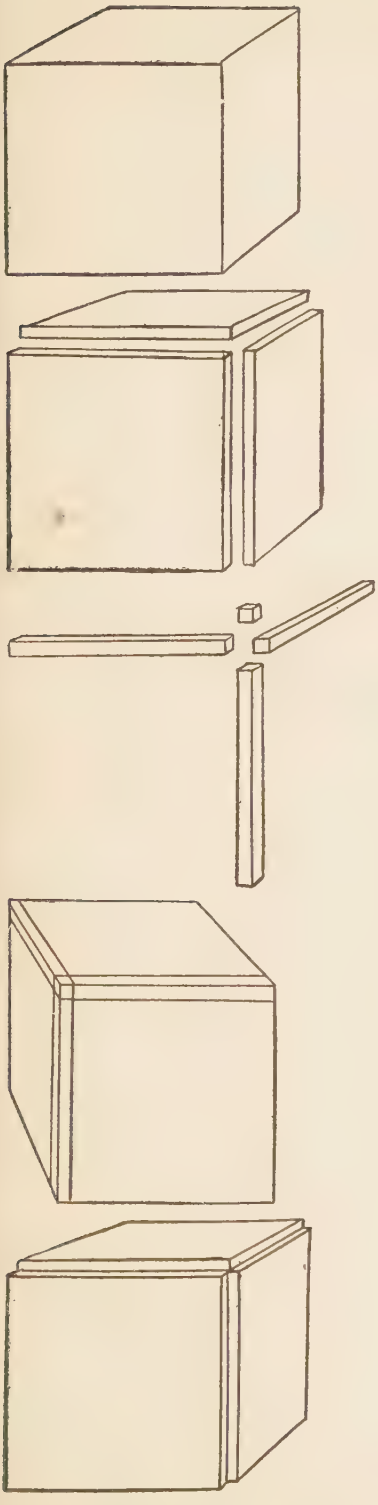
The most common applications of square root are:

1. Finding the dimensions of the square when the area is given.
2. Finding any side of a right triangle when the other two sides are given.

The two methods of extracting the square root are:

1. By factoring when the roots can be exactly obtained. Resolve any perfect power into its prime factors and take the product of half of these for the root.
2. By tens and units applicable to large numbers and imperfect powers. The square of a number consisting of two places of figures is equal to the square of the tens, plus twice the product of the tens by the units, plus the square of the units.

Diagrams should be used in developing this principle.



Cube root is the process of resolving a given number into three equal factors or of finding the length of one edge of a cube.

The radical sign ($\sqrt[3]{\ }$) with the small figure 3 over it, denotes that the cube root of the number over which it stands, is to be extracted. Thus, $\sqrt[3]{1728} = 12$.

There will be one figure in the cube root of a perfect power for each three figures and surplus of three figures in the power.

The cube of a number is the product of the number used three times as a factor.

The cube root is one of the three equal factors.

Every divisor in cube root is area or surface, and every dividend is cubical contents.

Any additions made to a cube must be made to each of the three faces.

By the use of the geometric or block method it will be very easy for the student to understand the process of extracting the cube root. If one understands thoroughly the "reason why" for each step, it will be unnecessary to take up the study of the rule.

We give you diagrams representing the divisions, additions and dividends. These graphic illustrations will prove helpful and enable the student to evolve a rule.

Required to find the cube root of 110592.

PROCESS.

	110'592	40+8
	64 000	
$3\times40^2 =$	4800	46 592
$3\times40\times 8 =$	960	
$8^2 =$	64	
	5824	46 592

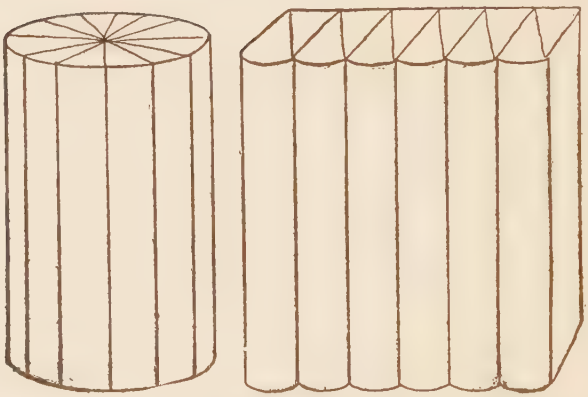
Every perfect cube consists of four parts, as illustrated above.

1. The cube of the tens.
2. Three times the product of the square of the tens by the units.
3. Three times the product of the tens by the square of the units.
4. The cube of the units.

Mensuration

MENSURATION.

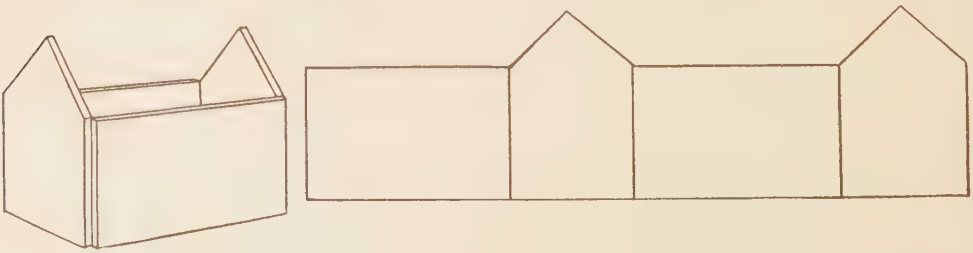
- Definitions.
- Circles.
  - Circumference.
  - Diameter.
  - Arc.
  - Radius.
  - Area.
  - Principles.
  - Applications.
- Plane figures.
  - Lines.
  - Angles.
  - Figures.
  - Construction.
  - Illustrations.
- Solids.
  - Definition.
  - Forms.
  - Volume.
  - Surface.
  - Examples.

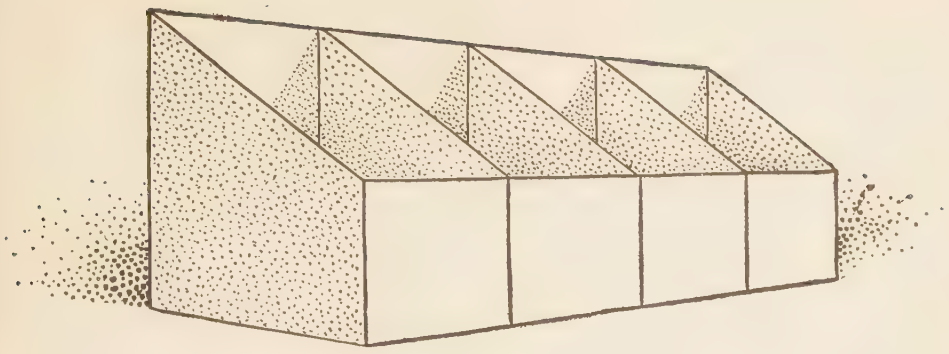


MENSURATION.

To find the volume of a prism or cylinder, multiply the area of the base by the altitude.

To find the convex surface of a right prism or cylinder, multiply the perimeter of the base by the height.





To find the number of bushels of grain in a bin or box, multiply the length in feet by the height in feet and then by the width in feet and then by 8, striking off the right hand figure. The result obtained will be the number of bushels. For instance: In a bin 10 feet long, 6 feet high and 8 feet wide, $10\times8\times6\times8=384.\not{0}$.

To find the approximate contents of a round bin or tank, square the diameter in feet and multiply by the depth in feet, then by 2 1/2, striking off the right hand figure. For instance: A tank 6 feet in diameter and 10 feet deep will contain $6^2=36$. $36\times10\times2\ 1/2=90.\not{0}$ barrels.

In estimating the contents of a cistern, one barrel is equal to 31 1/2 gallons and one hogshead to 2 barrels.

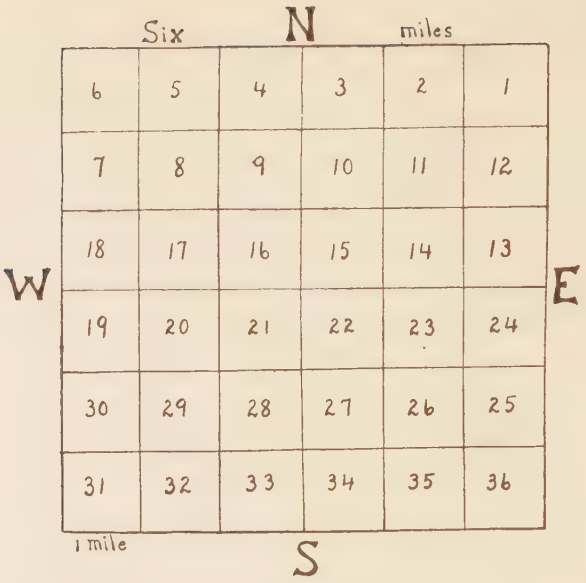
To find the number of barrels a cistern will hold, multiply the square of the diameter of the cistern in feet by the height in feet and divide this result by 4. For instance, if a cistern is 6 feet in diameter and 8 feet deep it will hold $6^2=36$. $36\times8=288\div4=72$ barrels.

To find the number of barrels in a square cistern, multiply the width, height and depth together and divide the product by 4. For instance:

A cistern 6 feet wide, 8 feet long and 4 feet deep, multiplied together equals 192. $192\div4=48$ barrels of 31 1/2 gallons each.

A tank 5 feet square will hold 6 barrels for every foot of depth.
A tank 6 feet square will hold 8 1/2 barrels for every foot of depth.
A tank 7 feet square will hold 11 1/2 barrels for every foot of depth.
A tank 8 feet square will hold 15 1/4 barrels for every foot of depth.
A tank 9 feet square will hold 19 1/2 barrels for every foot of depth.
A tank 10 feet square will hold 23 3/4 barrels for every foot of depth.

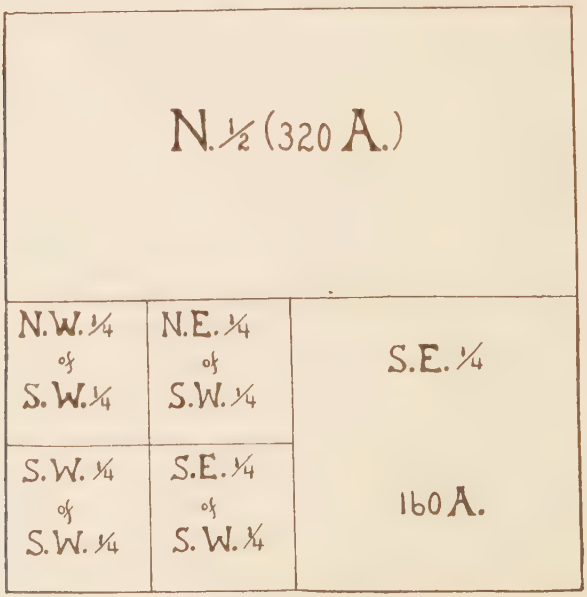
To find the medium diameter of a cask or barrel, add to the head diameter 2/3 of the difference between the head and bung.



A regular township, according to United States surveys, is 6 miles square and is divided into 36 equal parts or sections, each section containing 640 acres and measuring one mile square.

To fix permanently these values in the pupil's mind, a few exercises can be given in connection with the study of this diagram, such as:

How many acres of land in 4 3/4 sections?
How many more acres in 7 1/2 sections than there are in 3 sections?



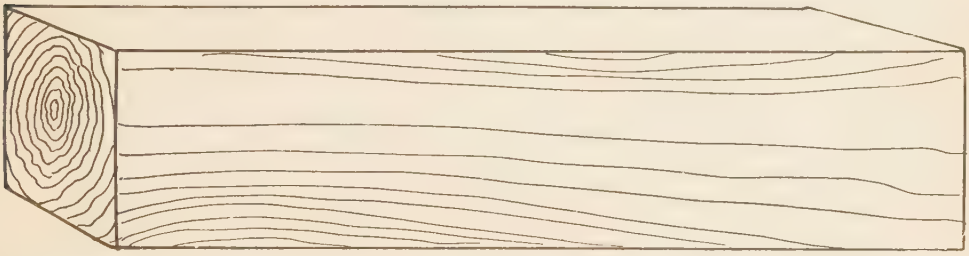
How many acres of land in 1/2 section?
How many acres of land in 2 1/2 sections?
How many acres of land in 5 sections?
How many more acres in 3 1/2 sections than in 2 sections?

To familiarize the pupils with the different divisions of a township, have them make diagrams showing farms located in different sections, such as—

The N. 1/2 of the S. E. 1/4.
The W. 1/2 of the S. E. 1/4.
The S. W. 1/4 of the N. E. 1/4.
The S. 1/2 of the N. W. 1/4.

Then after locating such farms interesting problems can be made computing the value, as:

What will be the cost at $35.50 per acre of a farm comprising the N. 1/2 of the S. E. 1/4?



A board foot, used in measuring lumber, is 1 foot long, 1 foot wide and 1 inch thick.

In computing dimensions of lumber, do not use fractions. If a board measures between 5 and 6 inches in width; if nearer 5 call it 5 inches and if nearer 6, call it 6.

To find the number of feet in a number of 12-foot boards, find the total width of the boards in inches and the sum will equal the number of feet in the pile.

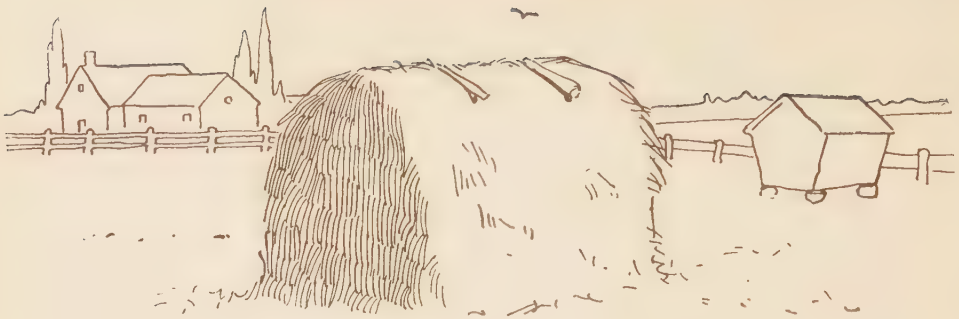
To find the number of feet in a number of 14-foot boards, add to the total widths of the boards 1/6 of the sum obtained.

To find the number of feet in 16-foot boards, add to the sum of the widths of the boards 1/3 of the result. For example: To find the number of feet in 6 boards 8 inches wide and 14 feet long, 6×8=48. 1/6 of 48=8. 8+48=56 feet, the number of feet contained in the boards.

To find the number of feet of lumber contained in a fence, multiply the sum of the widths of the boards in a portion of the fence by 16 1/2 and if more than 1 inch thick by the thickness, and divide by 12. The result obtained will be the number of feet contained in a rod of fence and this multiplied by the number of rods of fence will give the number of feet of lumber used. To illustrate:

To find how much lumber will be required to fence a square mile of land with three 6-inch boards and one 10-inch board in each panel of fence, 3×6 +10=28 inches, total width of boards in each panel. 28×16 1/2 : 12=38 1 2 feet in each rod of fence. The number of rods of fence around a square mile of land equals 1,280 rods multiplied by 38 1/2=49,280 feet, number of feet of lumber in the fence.

To find the number of laths required in a room, find the number of square yards in the room and multiply by 18.



A ton of dry hay is estimated at 500 cubic feet to the ton.

To find the number of tons in a mow, multiply the length in feet by the height in feet and then by the width in feet and divide the result by 500. To illustrate: In a mow 30 feet long, 10 feet high and 20 feet wide there will be 30×10×20÷500=12 tons.

To find the number of tons in a stack, multiply the width in feet by the length in feet by 1/2 the height and divide by 500. For example: A stack 20 feet long, 10 feet high and 15 feet wide will contain 15×20×5 : 500=3 tons in the stack.

To find the contents of a round stack, multiply the distance around the stack in yards by itself and then multiply by 4 times the height in yards, striking off two places from the right of the result thus obtained. This gives the number of cubic yards in the stack and by dividing by 20 will give the number of tons. To illustrate: A stack 20 yards around and 8 yards high will contain 20×20×32=128øø. 128øø÷20=6 2/5 tons.

To find the contents of a crib in bushels of shelled corn, multiply the number of cubic feet in the crib by 4 and strike off the right hand figure. To illustrate: A crib 18 feet long, 10 feet high and 8 feet wide will contain 18×10×8×4 or 576ø bushels.

To find the number of heaped bushels of ear corn contained in a crib, multiply the number of cubic feet in the crib by 6 and strike off the right hand figure, as, a crib 15 feet long, 10 feet high and 8 feet wide will contain 15×10×8×6 or 720ø bushels.

When the sides of the crib are flared, multiply the height in feet by half the sum of the top and bottom widths and then multiply by the length in feet, multiplying the result by 4 and striking off the right hand figure. For example: A crib 12 feet wide at the top, 8 feet wide at the bottom, 14 feet long and 10 feet high will contain 12+8÷2=10 feet, average width. 10×10×14×4=560ø bushels.

RULES IN MENSURATION.

To find the slant height of a cone when the diameter of the base and the altitude is given, extract the square root of the sum of the squares of the altitude and one-half the diameter.

To find the area of the convex surface of a regular pyramid or cone, multiply 1/2 the sum of the perimeter of the two bases by the altitude.

To find the area of the surface of a sphere, multiply the circumference by the diameter.

To find the volume of a sphere, multiply the convex surface by 1/3 of the radius.

To find the area of a parallelogram, multiply the base by the altitude.

To find the area of a triangle, multiply the base by 1/2 the altitude.

To find the area of a trapezoid, multiply 1/2 the sum of the parallel sides by the altitude.

To find the area of a polygon, divide into triangles and find the sum of their areas.

To find the area of a circle, multiply the radius by 1/2 the circumference.

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the hypothenuse of a right-angled triangle, when two dimensions are given, extract the square root of the sum of the squares of the three dimensions.

To find the base or perpendicular of right-angled triangle, from the square of the hypothenuse subtract the square of the given side and extract the square root of the remainder.

To find the volume of a pyramid or cone, multiply the area of the base by the altitude and divide by 3.

To find the convex surface of a cylinder, multiply the circumference of one base by the altitude.

To find the volume of a cylinder, multiply the area of one base by the altitude.

To find the volume of the frustum of a regular pyramid or cone, multiply the sum of the areas of the two bases plus the square root of their product by 1/3 the altitude.

To find the contents of an irregular body, immerse the body in a vessel full of water, and measure the quantity of water displaced.

To find the area of a rectangle, multiply the length by the breadth.

To find the diameter of a circle, divide the circumference by 3.1416; or multiply it by .318309.

To find the side of a square equal to a given circle, multiply the diameter by .886227 or ½ of $\sqrt{3.1416}$.

To find the diameter of a circle equal to a given square, multiply the side of the square by 1.12838.

To find the side of an inscribed square, multiply the diameter by .707106, ors $\sqrt{5}$; or the circumference by .225079.

To find the circumference from an inscribed square, divide the side of the square by .225079.

To find the side of the largest inscribed equilateral triangle, multiply the diameter by .866025.

To find the diameter of the three largest equal circles that can be inscribed in a given circle, divide the diameter of the given circle by 2.155.

To find the contents of a cube, multiply three sides together.

To find the surface of a cube, multiply the square of the length of one of its sides by 6.

Business Forms.

TIME NOTE WITH INTEREST.

$450. Memphis, Tenn., Feb. 4, 1901.

For value received, sixty days after date I promise to pay to John G. Rogers, or order, four hundred fifty and 00/100 dollars, with interest at 6% per annum.

GEORGE L. HOLMES.

DEMAND NOTE.

$500. New York, Sept. 7, 1903.

On demand, for value received, I promise to pay to Edward L. Reynolds, or order, five hundred and 00/100 dollars, with interest at 7%. WILLIAM ROBERTS.

JOINT NOTE.

$650. Chicago, Ill., June 15, 1906.

Ninety days after date, for value received, we promise to pay to the order of Robert L. Taylor, six hundred fifty and 00/100 dollars, with interest at 6%, at the First National Bank of Chicago.

THOMAS L. HANLEY.
MARY B. HANLEY.

SIGHT DRAFT.

$560.50. Bloomington, Ill., Aug. 4, 1905.

At sight, pay to the order of Albert L. Bond five hundred sixty and 50/100 dollars, value received, and charge to the account of FIRST STATE BANK.

To Prairie State Bank, Chicago, Ill.

TIME DRAFT.

$150. San Francisco, Cal., Dec. 1, 1905.

Thirty days after date pay to the order of M. A. Mitchell, one hundred fifty and 00/100 dollars, at the First National Bank of Los Angeles, and charge to the account of

To Reed, Jones & Co., Los Angeles, Cal. NORMAN A. PALMER.

ORDER.

$40. Baltimore, Md., May 9, 1904.

Please pay to Richard A. Fenton, forty dollars, and charge to the account of

To Franklin Bros. Co., Baltimore, Md. HENRY W. ALLEN.

DUE BILL.

$190. Cincinnati, Ohio, March 1, 1902.

Due James L. Arnold, for value received, one hundred ninety dollars.

D. A. CURTIS.

RECEIPT.

$125. Madison, Wis., June 10, 1903.

Received of Herbert R. Morris, one hundred twenty-five dollars, in settlement of account.

JAMES R. STONE.

IN FULL OF DEMAND.

Johnstown, Pa., May 5, 1901.

Received of James M. Brown, four hundred fifty dollars, in full of all demands to date.

FRANK L. MARTIN.

ORDER FOR GOODS.

Ward, Smith & Co., Tacoma, Wash. Everett, Wash., Nov. 1, 1906.

Deliver to R. S. Marsh, merchandise to the value of seventy-five dollars and charge to my account. WILTON S. LONG.

Every book is a good book that sets the reader in a working mood. The deep book, no matter how remote the subject, helps us best.
—*Emerson.*

The Arts

THE NEW PRACTICAL REFERENCE LIBRARY devotes much space to subjects relating to the FINE ARTS. The most casual observer and reader will admit we are indebted to countless generations for our present state of civilization. That we should know of their unceasing struggles for success seems proper and fitting. No channel affords a better means for such knowledge than a knowledge of the FINE ARTS.

The general articles on ARCHITECTURE, SCULPTURE, PAINTING, MUSIC, etc. (elsewhere outlined), are interestingly and fully treated. Throughout each article will be found innumerable cross references, which, if looked up, will give a broad and clearly defined conception of these important branches of knowledge.

The parent or teacher will find it easy to arouse deep interest on the part of the boy and girl by beginning with queries closely associated with their own surroundings. For instance, questions such as these: "In what style of architecture is the schoolhouse built? The city hall? The court house? Your home?" "Is this picture done in water color or oil?" "When, where and by whom was the first piano made?" etc., will not only create the proper degree of interest but will stimulate observation and develop a desire to know more and more of these branches which ultimately will lead the young student to trace each branch to its earliest known history. It is only by knowing the past that we can fully understand and appreciate the present.

Through the study of architecture and sculpture we get glimpses of the life, customs, education, civilization, religious beliefs and ambitions of the early peoples of Egypt, Greece and Rome, as revealed by their magnificent tombs, their massive pyramids with their hieroglyphics, their obelisks, and their gods of idolatrous worship.

The natural and refining influence gained in the study of music and art, the delving into the biographies of world-famous musicians and artists, are indispensable acquisitions, to say nothing of the broadening effect to one's knowledge.

By the proper use of THE NEW PRACTICAL REFERENCE LIBRARY in any home or on the desk of the teacher, a study of, and an intimate acquaintance with, these important branches of human activity becomes not only possible but delightfully pleasant.

Architecture

The study of ARCHITECTURE is as important as it is instructive and interesting. The student who reads the interesting article on PYRAMIDS and correlated subjects in THE NEW PRACTICAL REFERENCE LIBRARY must be profoundly impressed with the ability and skill displayed by the nations of the long ago, and lost in fascinating wonder when he dwells on the genius of that time as illustrated by the raising, moving and proper adjusting of slabs of marble and granite, weighing hundreds of tons, for the temples and tombs, tasks beyond the accomplishment of the most skilled architect and engineer of our times, aided by twentieth century inventions.

It is our aim to give a mere skeleton to the study of ARCHITECTURE, leaving the searcher for knowledge the pleasant and profitable task of outlining the various phases of this study as extensively as desired. All the principal buildings of the world, such as WESTMINSTER ABBEY, are each fully described under their proper headings and thus furnish the teacher and pupil an inexhaustible field for interesting study.

ARCHITECTURE—ANCIENT AND MEDIEVAL.

EGYPTIAN ARCHITECTURE.
- Style.
- Construction.
- Permanency.
- Religious belief.
- Tombs.
- Temples.
- Pyramids.
- Statues.
- Hieroglyphics.

CHALDEAN-ASSYRIAN.
- Construction.
- Sun-dried brick.
- Carved stones.
- Stucco.
- Vaults.
- Arches.

GOTHIC.
- Origin—time—place.
- Characteristics.
- Decorations.
- Pointed arch.
- Examples.
  - Notre Dame, Paris.
  - Cathedral Cologne.
  - Cathedral Rheims.

ORIENTAL.
- Style.
- Endurance.
- Towers.
- Monasteries.
- Pagoda.

GREEK.
- Style.
  - Beauty.
  - Simplicity.
  - Harmony.
- Period of perfection.
- Orders.
  - Doric.
  - Ionic.
  - Corinthian.
- Sculpture.
- Painting.
- Column.
- Examples.
  - Parthenon.
  - Erectheum.
  - Theseum.
- Theater.

ROMAN.
- Aqueducts.
- Sewers.
- Amphitheaters.
- Magnificent villas.
- Triumphal arches.
- Monumental pillars.
- Thermæ (baths).
- Examples.
  1. Colosseum.
  2. Pantheon.

BYZANTINE.
- Time and place of origin.
- Dome.
- Examples.
  - Sophia, Church of Saint.
  - Saint Marks, Venice.

ROMANESQUE.
- Semi-circular arch.
- Towers.
- Porches.
- Crypts.
- Ornamental façades.
- Rib.
- Examples.
  - Church of San Ambrogolio.
  - Cathedrals at Speyer and Worms.

Correlated subjects:
- Cathedral.
- Window.

The subjects listed below will be found interestingly treated in THE NEW PRACTICAL REFERENCE LIBRARY. The reader will in turn be referred to other correlated subjects which, if looked up, should make the study of ARCHITECTURE delightfully complete and entertaining.

Acropolis.
Arch.
Acoustics.
Aqueduct.
Bridges.
Building.
Dome.
Façade.
Hall.
Babel, Tower of.
Baptistry.
Buttress.
Colosseum.
Basilica.
Amphitheater.
Carving.
Catacombs.
Column.
Cathedrals.
Church.
Frescoes.
Mosaics.
Theater.
Vault.
Campanile.
Gable.
Indian architecture.
Roof.
Spire.
Window.
Pyramid.
Temple.
Stadium.
Crypt.
Sphinx.
Forum.
Pagoda.
Elizabethan architecture.

QUESTIONS.

What is architecture? To what remote period can we trace it?

In what style of architecture is your church built? Your schoolhouse? Your county court house? Your city hall? Your state capitol? The National Capitol at Washington?

For how many years did Cheops employ one hundred thousand men to erect the great pyramid? How many acres does it cover?

What is yet the height of the great pyramid? What does its interior contain?

What special claim have the Egyptians to distinctive architecture? Was architecture their supreme art?

With what were the temples, tombs and statues of Egypt decorated?

Why were the tombs of the Egyptians built so strong that time could not destroy and enemies could not rifle them?

What place in Egypt because of its many pyramids is called the "Westminster Abbey of Egypt"?

What is the generally accepted belief as to the construction of the pyramids? How did the length of a king's reign affect the size of the monument?

Describe the Greek sphinx of mythology.

What riddle did the sphinx of Grecian mythology propose and who guessed it?

How were the Buddhist temples built out of solid rock?

What characterized the early Greek architecture? Who were the three great architects of Greece?

How would the seating capacity of the larger Greek theaters compare with those of today?

The Parthenon in the Acropolis at Athens is said to be the most perfect building ever erected. When was it built? Of what material? How long is it? How broad? How high? How many pillars did it originally have?

How did the Roman amphitheater differ from the Grecian theater?

What were the thermæ? What have the excavations at Pompeii revealed as regards the arrangements of the Roman dwelling house?

Describe the Pantheon at Rome. What is strikingly unique about its

magnificent dome? What famous painter is buried within its walls? What arch built about 500 B. C. can still be seen in Rome?

What models of nature are used for decorations on the Gothic style?

What group of recent buildings were unexcelled in their architectural beauty of design?

Sculpture

The outline on SCULPTURE is made brief from lack of space. The student and reader, however, can delve deeply into this interesting and instructive department by referring to the scores of correlated subjects in THE NEW PRACTICAL REFERENCE LIBRARY. For example, if detailed information is wanted about the characteristic Egyptian sculpture, the student will refer to the articles on SPHINX, PYRAMIDS, TOMB, OBELISK, HIEROGLYPHICS, etc. If the details of the Grecian style of sculpture are desired, one is referred to the PARTHENON and the TEMPLE OF THESEUS, and to the famous Greek sculptors, LYSIPPUS, PHIDIAS, etc. If the detailed history of sculpture in our own country is sought, ample information will be found in looking up the biographies of noted sculptors, like SAINT GAUDENS, LORADO TAFT, BROWNE, etc.

SCULPTURE.

I. KINDS.
  1. Carving.
    a. Methods.
    b. Materials.
  2. Modeling.
    a. Construction.
    b. Casting.
    c. Materials.

II. FORMS.
  1. In the round. Object stands how? Give example.
  2. In relief. Object projects in what manner? Give example.
  3. In intaglio. Cut how?

III. HISTORY.
  1. Egypt—Characteristics—Type.
  2. Assyria—Compare with Egyptian—Lacking in what?
  3. Greece.
    a. Early period—Character—Style.
    b. 500 B. C.—Progress—Aim—Blending of what?
      Sculptors—Art reached perfection when?
      Masterpieces. Name three.
    c. 350 B. C.—Aim.
      Masterpieces. Name them.
      Sculptors. Name three.
  4. Italy.
    a. Early period—Imitation of what style?
    b. Twelfth century—Characteristics—Aim.
      Masterpieces. Name the three most famous.
      Sculptors. Who were the most noted? Of these the most famous?
    c. Eighteenth century—Progress—Aim—Results.
    d. Modern—Aim.
      Masterpieces. List four of the most famous.
      Sculptors. Name four.

5. France.
   a. Early period—Status.
   b. Fifteenth to eighteenth century—Aim—Influence.
   c. Modern school.
      Sculptors. Name four, with masterpieces of each.
6. Germany.
   a. Early period—Status—Lacking in what?
   b. Renaissance—Style—Name four sculptors.
   c. Modern school—Influenced by whom?
      Sculptors, and masterpieces of each.
7. England.
   a. Early period—Scope.
   b. English school dates from what time?
   c. Nineteenth century—What spirit pervaded English art?
   d. Modern school—Style—Aim.
      Sculptors. Name five and give masterpieces of each.
8. United States.
   a. Modern school—Style—Aim—Results.
      Sculptors. List five of America's most famous sculptors.
      Masterpieces. Give location of five masterpieces. By whom?

QUESTIONS.

What is sculpture?
What are the materials most generally used?
In what country was sculpture first practiced?
What specimens of this early period exist today?
When does the sculptor's work proper end?
What is the characteristic of American sculpture?
How has sculpture aided us in knowing of the early history of the world?
What are the three forms of sculpture usually recognized?
To what form does the sculpture in your city belong?
What are the most famous statues by Saint Gaudens? Where located?
Who made the famous "Liberty" statue? What is its height? What is remarkable about it?
What are the principal works of Thorwaldsen?
What is the striking characteristic of his "Christ the Comforter" (see full-page illustration), and where found?
In what museum is the statue illustrating "The Dying Gaul" placed? (See full-page illustration.)
For what is Lorado Taft noted? Greenough? Browne?

NOTE.—Biographies of the following list of sculptors will be found interesting. Others may be added as your time will permit.

Phidias.	Ghiberti.	Canova.	Schadow.
Praxiteles.	Donatello.	Houdon.	Partridge.
Lysippus.	Vinci.	Bartholdi.	Dupre.
Greenough.	Michelangelo.	Kraft.	Thorwaldsen.
Ward.	Bernini.	Taft.	Daniel French.
Foley.	Browne.	Flaxman.	William Story.
Cellini.	Saint Gaudens.	Hosmer.	Drake.
Gibson.	Crawford.	John Rodgers.	Randolph Rodgers.

Painting

The general article on painting in THE NEW PRACTICAL REFERENCE LIBRARY gives a comprehensive review of the development of this fascinating art from the earliest times in the different nations as exemplified by the various schools.

The student will find it a pleasant task to acquaint himself by aid of this satisfactory guide with this delightful branch of human knowledge. He will find interesting, instructive biographies of all the noted painters under their respective titles from the earliest times to those of the present day, with mention and description of their masterpieces.

That such a fund of knowledge is in itself a source of pleasure is self-evident. That it has a natural refining and elevating influence no one can gainsay. To live but for a few brief minutes daily in the atmosphere and have for silent companions MICHELANGELO, RAPHAEL, RUBENS, LANDSEER, ROSA BONHEUR, and scores of others, must broaden the intellect, quicken the imagination, sweeten the heart and inspire to nobler ambitions.

It certainly should be the pleasant duty of every parent and teacher to create and foster a love for all that is beautiful in art as in literature.

PAINTING.

DIVISIONS.

Decorative.
- (a)
- (b)

Portrait.
Genre.
Landscape.
Seascape.
Architectural.
- (1)
- (2)

GREAT PAINTERS (which see).

Giovanni Cimabue.
Van Eycks.
Hans Membling.
Leonardo da Vinci.
Michelangelo.
Titian.
Fra Bartolomeo.
Andrea del Sarto.
Rembrandt.
Raphael.
Correggio.
Burne-Jones.
Whistler.
Landseer.
Sargent.
Murillo.

MATERIALS USED.

Oil.
- Wood panels.
- Canvas.

Water Color.
- Paper.

Fresco.
- Wet plaster.

Tempera or Distemper.
Enamel.

TWELVE GREAT PAINTINGS.

Transfiguration. Raphael.
Sistine Madonna. Raphael.
Last Judgment. Michelangelo
Communion of Saint Jerome.
Descent from the Cross. Rubens.
Descent from the Cross. Volterra.
Last Supper. Vinci.
Assumption of the Virgin. Titian.
The Night. Corregio.
Aurora.
Beatrice Cenci. Guido Reni.
Immaculate Conception. Murillo.

HISTORY.

Ancient Period.
- In Egypt.
  - On Tombs.
  - Temples.
  - Mummy Cases.
  - Papyrus.
  - Representative of what.
- In Greece.
- In Rome.
  - Pompeii.
  - The Baths.
  - The Tombs.
  - The Catacombs.
  - Byzantine Decorations.

Mediæval Period.
Renaissance Period.
- Schools—
  - Florentine School.
  - Venetian School.
  - Umbrian School.
  - Roman School.

Sixteenth Century.
Later Periods.
History in United States.

QUESTIONS.—Painting.

What is the art of painting? What is oil painting? Water color? Fresco? Enamel? How produced?

How and on what were the early paintings of the Egyptians, Greeks and Romans executed?

How many centuries before Christ was painting practiced in Egypt? Was the art closely related to religion and a result of it? In what relation was it held to sculpture and architecture?

What do these early Egyptian paintings generally represent and on what were they generally pictured?

Was any attempt made by these artists to imitate nature?

Of what great historic value are these early Egyptian paintings? Give three reasons for your answer.

By whom were the principal works of Roman art produced?

Describe the conditions of Roman painting for the first three centuries after Christ.

What were the Catacombs (see)? How were they built? Decorated? Protected? Inhabited?

By what art in the Catacombs did the early Christians indicate their religious devotion?

Who was one of the first great English painters?

What does the Umbrian school characterize?

What was striking about the Florentine school?

When did art in the United States take on an individuality of its own?

What are the strikingly distinguishing marks between American art of 1855 and 1900?

Name five well-known American painters, with a great painting from each. For what was Whistler noted?

What are the twelve greatest paintings in the world; by whom, where found, and when produced?

What kinds of knowledge are requisite in a painter?

What discovery of the Van Eycks produced a revolution in the art of painting?

By what process are mosaics made?

Where are the early Egyptian paintings found and what is their character?

What are the only examples of pure Grecian painting?

What was the Byzantine influence on painting?

What did the Renaissance do for Italian painting?

Why was Italian art of the fifteenth century often better than any that followed?

What was the greatest period in the history of modern art? What brought about a decline?

What are the chief names in the history of nineteenth century painting?

What is the general process of fresco painting? When was its greatest development?

What was the first or mosaic method of making ornamental glass windows?

What is the combination method of today?

What are the distinguishing features of Byzantine art?

What is meant by the Rembrandt style of picture?

Music

In THE NEW PRACTICAL REFERENCE LIBRARY the department of music is under three heads: musical terms, musical instruments, and biographies of musicians. The general article *Music* contains the subheads: NATURE AND TERMINOLOGY OF MUSIC, NOTATION and HISTORY, the last subdivision containing references to the greatest of the world's musicians of all times.

The list of terms given in the outline under the subhead musical terms contains but a small proportion of the articles included in the encyclopedia. The article musical instruments is but a list of cross references to the most important instruments. Many of the biographies of the greatest composers, singers and instrumentalists may be reached by means of cross references from the general article *Music*. There are also in this department of music a number of general articles on such topics as *Hymns* and *Hymn Tunes* and *Hymns, National*.

MUSIC.

I. TECHNICAL.
   1. Nature and theory of.
   2. Terms used.
   3. Notation or reading of.
   4. Pitch and duration of tones.

II. MUSICAL TERMS.
   1. Orchestra.
   2. Opera.
   3. Harmonics.
   4. Oratorio.
   5. Harmony.
   6. Recitative.
   7. Scale.
   8. Singing, etc.

III. MUSICAL INSTRUMENTS.
   1. Drum.
   2. Cornet.
   3. Violin.
   4. Pianoforte.
   5. Organ.
   Others.

IV. GREAT MUSICIANS.
   1. Handel.
   2. Beethoven.
   3. Mendelssohn.
   4. Bach.
   5. Patti.
   6. Sousa.
   7. Nordica.
   8. Kubelik.
   9. Rubenstein.
   10. Paderewski.

V. HISTORY.
   1. Ancient.
      Egypt.
      Assyria.
      India.
      Greece.
      Rome.
   2. Modern.
      German.
      Italian.
      Russian.
      English.
      Swedish.

CORRELATED SUBJECTS:

NOTE.—Consult names of all noted musicians under general subject "Music."

Also:

Jennie Lind.	Balfe.	Corelli.	Strauss.	Weber.
Auber.	Berlioz.	Schumann.	Schubert.	Offenbach.
Bach.	Chopin.	Myerbeer.	Wagner.	Others.

QUESTIONS.

Of the fine arts which is the finest and purest?
From what relative did Mme. Patti receive her musical training?
What popular opera has Sousa composed?
Under what familiar name did Madame Otto Goldschmidt appear?

What stage of music had England attained to in the time of Handel?

What is the general character of the Scandinavian music?

Why of all the arts does music appeal to the rank and file the most?

What did each of the following nations try to emphasize in their music: Italy, Germany, England, Scandinavia and France?

Why is music largely characteristic of the nation?

What factor has Christianity been in the growth of music?

What were some of the ancient musical instruments? Give a list of modern instruments.

Give a list of the famous composers of music. A list of celebrated players of instruments. A list of singers, sopranos, tenors, bass.

What is the record of Martin Luther in regard to music?

Of what nationality is Kubelik? What has been his career? Of what instrument is he a master?

Of what nationality is Paderewski? How old is he? Of what instrument is he master?

How old is Adelina Patti? How does she rank as a soprano?

What great oratorio did Handel compose? How was this received at the time?

What was the record of Theodore Thomas in Chicago? What in general was the aim of his work? What is Orchestra Hall? For what, and at what cost, was it erected?

For what is Reginald De Koven noted?

What part in singing does Edouard De Reszke take? What is his record?

What part does Jean De Reszke take? Give his record.

How does the violin rank as compared with other instruments?

What is the meaning of oratorio? Give a list of celebrated oratorios.

What is a military band? Who was the first celebrated leader of such bands? He has been succeeded by whom? What is the most celebrated military band in the United States?

What is the national hymn of the United States; Germany; England; France?

What are the best modern grand operas?

INTERESTING FACTS ABOUT HYMNS.

It has been estimated that there are at least 400,000 hymns in all languages. The greatest number of these is in German, and the next greatest number in English.

The oldest Christian hymn in existence is supposed to have been written by Clement of Alexandria, who lived from 150 to 215 A. D. The most common translation of it begins *Shepherd of tender youth.*

The Hebrews produced the most noted hymns before the Christian era.

The Mohammedans have no hymns.

Some of the greatest hymns of modern times are *Lead Kindly Light,* written by John Henry (Cardinal) Newman; *Nearer My God to Thee,* by Mrs. Sarah Flower Adams; *Just as I am Without One Plea,* by Mrs. Charlotte Elliot, and *One Sweetly Solemn Thought,* by Phoebe Cary. This last hymn was composed in a little chamber of a village cottage one Sunday morning on returning from church. It has been translated into nearly all languages of the civilized world.

Most hymns of modern times have been produced in connection with some religious movement; thus we have missionary hymns, gospel hymns and Sunday School hymns.

Engraving

I. Engraving.
   1. Line Engraving.
   2. Soft-Ground Etching.
   3. Wood Engraving.
   4. Mezzotint.
   5. Lithography.

II. Etching.
   1. Etching.
      a. Tools.
      b. Processes.
   2. Zinc Etching.

III. Photography.
   1. Camera.
   2. Processes.
      a. Photography.
      b. Daguerrotype.
      c. Electrotyping.
      d. Photograveur.
      e. Halftone.

IV. Correlated Subjects.
   1. Printing.
   2. Halftone.
   3. Etching.
   4. Aquatint.
   5. Mezzotint.
   6. Photography.
   7. Lithography.
   8. Electrotyping.
   9. Camera.

The remarkable changes in engraving and allied methods of illustration can be readily seen by comparing illustrated books and periodicals of the present day with those of thirty, twenty-five or even ten years ago. As the cheaper processes of half-tone and zinc etching have been perfected, they have replaced almost entirely the old wood engraving. Because of this displacing of his product, the old-style wood engraver, who was a workman of rare skill and often an artist as well, has nearly disappeared. For this reason illustrated books of former times become more choice as the age increases.

QUESTIONS.

What is engraving? What materials are used?

What were the early uses of engraving?

Where and when did engraving for the purpose of printing originate? What material was used?

When and by whom was printing from metal plates discovered?

What was the importance and scope of engraving in early times?

What other processes have largely done away with this art? Describe them and tell of their importance at the present time.

What is the process of producing a wood engraving? An engraving from metal?

What is a zinc etching? Why are they used so largely to illustrate the daily papers?

When did photography first come into use? Who was Daguerre?

Compare the process of ancient engraving with those in use today.

What is an electrotype? Lithography? Halftone?

The man who is fond of good books is usually a man of lofty thought and of elevated opinions. —*George Dawson.*

Astronomy

Astronomy is the science which treats of the heavenly bodies. A general survey of this subject, together with a short history, is given in the general article *"Astronomy,"* which therefore forms a suitable introduction to the subject.

The other phases of the subject may be found in articles to which cross references are made in this general article, such as *Sun, Moon,* etc.

Definitions of the most important astronomical terms are also included in this first division, which is connected by means of cross references with all other subjects bearing upon this department.

The biographical department contains articles on all the chief astronomers and gives all the particular work which they accomplished.

The study of astronomy can be made not only very extensive but very interesting, even to the boy, by reference to our splendid outlines and the explanatory articles in The New Practical Reference Library.

The general subjects are of early interest to every child mind. The pupil comes into such vital contact with the planet on which he lives; the sun which brings life to the earth; the moon and stars which shed their silvery beams about his way; in fact, touching nature at all points of his environment, his interest is easily aroused, and such phenomena as *Day* and *Night,* the *Seasons* and other interesting subjects will be early introduced by the successful teacher. The following outline will be helpful.

OUTLINE.

I. Definition.

II. History.
- 1. Ancient Egyptians.
- 2. Chaldeans.
- 3. Chinese.
- 4. Greeks.
- 5. Modern nations.

III. Systems.
- 1. Ptolemaic.
- 2. Copernican.

IV. Celestial Sphere.
- 1. Poles (North, South).
- 2. Celestial equator.
- 3. Circles of declination.
- 4. Parallels of declination.

V. Measurements.
- 1. Declination.
- 2. Right ascension.

VI. The Solar System.
- 1. Sun.
- 2. Planets.
- 3. Planetoids (asteroids).
- 4. Satellites.
- 5. Meteors.

VII. The Stellar System.
- 1. Stars.
  - a. Characteristics.
  - b. Number.
  - c. Size.
  - d. Distance.
- 2. Constellations.
  - a. Zodiac.
  - b. Milky Way.

c. Orion.
d. Great Bear.
e. Others.
3. Nebula.
Nebular hypothesis.

VIII. The Sun.
1. Size, distance.
2. Characteristics.
a. Photosphere.
b. Spots.
3. Motions.
4. Physical and chemical effects.
a. Light.
b. Heat.
c. Life.

II. Divisions of Time.
1. Day.
a. Divisions.
b. Sidereal Day.
c. Solar Day.
d. Civil Day.
2. Week.
a. Length.
b. Names of days.
3. Month.
a. Names and length.
b. Anomalistic Month.
c. Sidereal Month.
d. Lunar Month.
e. Solar Month.
f. Origin of the name.
4. Year.
a. Days.
b. Weeks.
c. Months.
5. Seasons.
a. Names.
b. Length.
c. Characteristics.

III. Planets.
1. Definition.
2. Number.
3. Name (Origin Name).
4. Corresponding Weight.

IV. Biographies of Astronomers.

Ptolemy.	Kepler.	Newton.	Herschel, Sir J.
Brahe.	Galileo.	Herschel, Sir W.	Halley.

V. General Divisions.
1. Descriptive Astronomy.
a. Description of the
Motions.
Figures.
Periods of revolution.
Other phenomena of the heavenly bodies.
2. Practical Astronomy.
a. Teaches how to observe the
Motions.
Figures.
Periodical revolutions.
Distance of the heavenly bodies.
How to use necessary instruments.
3. Physical Astronomy.
a. Explains cause of motions.
b. Demonstrates laws by which causes operate.
4. New Fields of Investigation.
a. Astro-Photography.
b. Spectrum Analysis.

First Studied: Most remote period 2500 B. C.
What remarkable phenomenon was recorded by the Chinese?

VI. Astronomy in India.
1. Annual motion of Jupiter and Saturn observed in 3000 B. C
2. Tables of the sun, moon and planets formed.
3. Eclipses calculated.

VII. Time of Alexander the Great.
1. Chaldeans had made astronomical observations for 1,900 years.
2. Regarded comets as bodies traveling how?
3. Predicted what?
4. Had what acquaintance with the universe?

VIII. Priests of Egypt.
1. Gave astronomy what?
2. Their ancient zodiacs.
3. What is shown by position of their pyramids?

IX. Among the Greeks.
1. Astronomy took scientific form.
2. Thales predicted solar eclipse.
3. Pythagoras (500 B. C.) promulgated theory that sun is center of universe.
4. Great progress made under Ptolemies.
5. Aristarchus (267 B. C.) taught double motion of the earth.
6. Hipparchus (150 B. C.) undertook catalogue of the stars.

X. System Propounded by Claudius Ptolemy.
1. Earth was center of universe.
2. Sun, moon and stars revolved around it.
3. Sphere of moon nearest to earth.
4. Spheres of planets next.
5. Spheres of fixed stars followed.
6. Two crystalline spheres succeeded these.
7. An outer sphere circumscribed all, wherein happy souls found abode.

XI. The Arabs.
1. Began to make observations middle of eighth century.
2. Continued in the science 400 years.
3. Made important observations of the disturbances of Jupiter and Saturn (A. D. 1000).

XII. Nicholas Copernicus. 1473-1543.
1. Introduced the system which bears his name.
2. Gives to sun central place in solar system.
3. Shows other bodies revolving around it.
4. This arrangement came to be generally received.
5. Substituted for complexities and contradictions of Ptolemy theory.

XIII. Tycho Brahe, Danish Astronomer.
1. Regenerator of practical astronomy.
2. Through his aid Kepler arrived at the following laws:
   a. That planets move in elliptical orbits, of which the sun occupies position of focus.
   b. That the imaginary straight line joining the sun and any planet moves over equal space in equal time.
   c. That the squares of the times of the revolutions of the planets are as the cubes of their mean distances from the sun.

XIV. Galileo.
1. Advanced the science how?
2. Established the truth of what theory?
3. Death occurred when?

XV. Newton.
1. Born when?
2. Did what for physical astronomy?
3. Deduced what theory?

XVI. Eighteenth Century.

1. The science enriched by Herschel's discovery of what?
2. Resolution of the Milky Way into myriads of stars.
3. Unraveling of the mystery of nebulæ.
4. Double and triple stars.
5. The analytical researches of Lalande, Lagrange, Delambre, Laplace.

XVII. Nineteenth Century.

1. Discovery of first four minor planets.
2. Existence of Neptune, more distant from the sun than Uranus.
3. Use of spectroscope and photography in investigation.
4. Former calculated distance of sun corrected.
5. Discovery of the two satellites of Mars.
6. Existence of an intra-Mercurial planet, named Vulcan, has not yet been verified.
7. Much work accomplished in ascertaining the parallax of fixed stars.

XVIII. Astronomical Topics.

1. Asteroids.
2. Comets.
3. Earth.
4. Moon.
5. Planet.
6. Solar System.
7. Stars.
8. Sun.

XIX. Works of Reference.

Proctor's "Other Worlds Than Ours."
"Half Hours with the Stars."
Flammarion's "Astronomy for Amateurs."
Young's "The Sun," "Astronomy."

QUESTIONS.

What would be your weight on the sun's surface? On the moon's?

What star gives out 6,000 times more light than the sun and is 100 times larger in diameter?

Which is larger, the sun or the north star?

How many years would it require a train running 60 miles an hour without a stop to reach the sun?

What is the distance of the sun from the earth? The moon? The nearest star?

What is said to be the height of the mountains on the moon? How do they compare with our highest peaks?

How does the length of the days and nights on the moon compare with our own?

By the use of the most powerful telescope how near is the moon brought to the earth?

What is called the lines of apsides? What is its peculiar motion? Is this motion the same in all planets?

What time is represented by the anomalistic year? Which is the longer, the anomalistic or the sidereal year? How much longer?

How does the diameter of the largest of the asteroids compare with that of the earth?

Note.—Representing the sun by a globe two feet in diameter, the earth would be twenty-two hundredths of an inch in diameter—the size of a very small pea or a "twenty-two caliber round pellet." Its distance from the sun on that scale would be just 220 feet, and the nearest star (still on the same scale) would be 8,000 miles away at the antipodes. —Young's "Astronomy," page 174.

Note.—If a boy could walk four miles an hour, or forty miles in a day of ten hours, it would require 730 days, or two years, to walk around the globe. To walk to the moon would require 7,000 days, or about twenty years.

While there are more than 270 asteroids now discovered, how does their total mass compare with that of the earth?

What was the first record of an astronomical event, and its very ancient date?

What ancient people were probably acquainted with the true system of the universe?

With what people did astronomy first take a somewhat scientific form?

Which of the Greeks taught the motion of the earth around its axis and around the sun?

When do meteors most frequently occur?

From what century does the present astronomical system date?

What is Aquarius, and when is the sun said to enter it?

What has been the most remarkable recent discovery in regard to comets?

In what manner is the term "earth shine" described?

What is the cause of an eclipse of the moon? Of the sun?

What is the average number of eclipses in a year?

Describe the term "coal sack," observed in the Galaxy, or what is commonly known as the Milky Way.

What is the course and the cause of the Milky Way?

What is the harvest moon?

What is the average diameter of the planet Jupiter?

What was the very valuable discovery regarding light made from observing Jupiter's satellites?

What is the theory concerning the distribution of water and land on the planet Mars?

What is the rare form of metal which is found in meteoric stones?

What are the gray plains of the moon?

To whom is the nebular hypothesis due? How is it now received by astronomers?

When and by whom was Neptune discovered? Is it visible to the naked eye?

How does the magnitude of the star Sirius compare with that of the sun?

What is the precession of the equinoxes?

What is computed to be the amount of light sent out from the sun?

Which of the planets has rings supposed to be made up of multitudes of satellites?

What festivals are survivals of sun-worship?

By what combination of principles is the telescope able to aid the eye?

What is the largest telescope in the world?

How short a day has Uranus and how long a year?

What two names did the ancients give Venus because of its alternate appearance in the morning and evening?

What is the zodiac? How was it divided by the ancients and what are the divisions called?

What is zodiacal light?

What two new fields of astronomical investigation have been opened up in recent years?

How has spectrum analysis helped establish the nebular hypothesis?

What star is approaching us and what one is receding from us?

How many years does it take light to come from the nearest star to us?

Why are some stars called variable, others temporary and others the fixed stars?

Which planet approaches nearest the earth?

To what two men is the systematizing of astronomy due?

What discovery of Newton practically completed the proof of the Copernican theory?

Why was Copernicus excommunicated by the pope?

Why is it more satisfactory to study the movements of the heavenly bodies by astro-photography than through the telescope?

What are the three main branches of astronomy? Which one of these divisions gives a description of the motions and figures of the heavenly bodies? Which division teaches us to observe the revolutions of the heavenly bodies? Name the division of astronomy which explains the causes of the motions and demonstrates the laws by which these causes operate.

What is the difference between an observatory and a laboratory? Where is the famous Yerkes observatory?

Who invented the telescope?

What led Galileo to observe the laws governing the oscillation of the pendulum? To what important discovery did this lead?

Why do we regard the sun as the most important of the fixed stars?

What is the diameter of the sun?

INTERESTING FACTS.

Some of the spots on the sun are 100,000 miles in diameter. Could the earth be placed in the center of one of these spots and viewed from a point on the circumference, it would appear to the observer about four times as large as the moon does to us.

The spectroscope shows that the sun and stars are composed of the same substances as are found in the earth. What does this tend to prove?

Experiments show that the heat of the sun is sufficient to warm a shell of water having a diameter equal to the radius of the earth's orbit and a depth of four-tenths of an inch, 7° Fahrenheit in one minute.

The satellites of Jupiter are about the size of our moon, being from 2,000 to 3,000 miles in diameter.

The time required for a planet to make a revolution round the sun constitutes the year of that planet. Measured by the time of the earth's revolution round the sun, the planet's years are respectively as follows: Mercury, 88 days; Venus, 7 1/2 months; Mars, 1 year, 10 months and 22 days; Jupiter, 11 years, 10 1/2 months; Saturn, about 30 years; Uranus, 84 years, and Neptune, 165 years.

Because of their periodic return and peculiar appearance, comets are among the most interesting of the heavenly bodies. The ignorant and superstitious associate their appearance with dire calamities, such as war, pestilence and the end of the world. Newspapers publish now and then statements which are given out as coming from some eminent astronomer, and containing predictions of the exact time and place at which a comet which is attracting attention will strike the earth, and shatter it to fragments. Such statements should never be taken seriously. Astronomers never make them, and they do not rest upon any foundation of fact.

We may imagine the earth floating around the sun on a boundless ocean, both sun and earth being half immersed in it. This level, this plain, the plane of the ecliptic (because all eclipses occur in it), is used by astronomers as we use the sea-level. We say a mountain is so far above the level of the sea. The astronomer says the star is so high above the level of the ecliptic.—Lockyer.

No profit grows where is no pleasure taken.
—*Shakespeare.*

Athletics

The American parent and teacher invariably encourage a desire for manly, healthy sports and pastimes in the child, and, indeed, this would be a dreary world if everybody worked all the time and never took any recreation; so, too, might this be called a dull work did it not give special treatment to this subject.

With the above thought in view THE NEW PRACTICAL REFERENCE LIBRARY gives space to these subjects, treating them in an interesting way, emphasizing the point that such sports and pastimes are not only recreation but are intellectual and developing in their nature.

We divide this subject into several classes, and briefly outline the subject of *Football.*

OUTDOOR GAMES.

Ball, Baseball; Cricket, Football, Archery, LaCrosse, Quoits, Polo, Bowls, Croquet, Curling, Tennis, Golf.

INDOOR GAMES.

Billiards, Casino, Cribbage, Whist, Chess, Checkers, Dominoes, Legerdemain.

SPORTS.

Rowing, Racing, Bicycling, Swimming, Boxing, Yachting, Angling, Fencing, Olympic Games, Gladiatorial Contests, Chariot Races.

ATHLETIC TRAINING.

Gymnastics, Calisthenics, Wrestling, Dancing.

The interest in athletics manifested in colleges is shown by the construction of large and well equipped gymnasiums, and, in case of Syracuse University, a stadium in which Olympian games can be celebrated.

Among colleges, the Y. M. C. A. and nearly all other organizations, the tendency is to purge athletics of all objectionable features.

Football

I. GENERAL DESCRIPTION.
  1. Sides.
    a. Number of men.
    b. Position.
    c. Duties.
    d. Movements.
      Scrimmage.
      Punting.
    e. Rules.
    f. Restrictions.
    g. Scoring.
      Touchdown.
      Goal.
      Field Goal.
      Safety.

II. ANCIENT.
  1. Rome.
  2. Greece.

III. MODERN.
  1. United States.
    a. Participants (Colleges and Universities chiefly.)
    b. Season.
    c. Places of contest.

2. England.
    a. Rugby.

IV. VALUE.
1. Sporting.
2. Hygienic.
    Strength, endurance, speed, agility, quickness of thought, etc.
3. Moral.
    a. Sense of honor quickened.
    b. Body brought to perfection.
    c. Temperance, self-denial, etc.

QUESTIONS.

If you were making application for membership to an important football team what requirements would you have to possess to be accepted?

How does football compare in popularity with baseball? Is it known as a national game?

What is now the length of a football half?

At what season is the game played in the United States, and as a rule by whom?

What is meant by the terms: touchdown, quarterback, halfback, coach, etc.?

What late movement has resulted in eliminating unnecessary violence and liability to injury?

What are the points in favor of this game? In what manner is it particularly beneficial to the participant? To the spectator?

What national holiday in some parts of the United States marks the closing of the football season?

Name physical qualities necessary for one to participate in this game.

What is said to be the national game of the United States?

What nation apparently seems to be leading in athletics?

What outdoor game is adapted to both sexes?

Cricket is the national game of what country?

Why does golf recommend itself as an outdoor game?

What sports are followed in connection with water?

Give reasons for outdoor sports gaining in popularity. Where is this especially true? What good results will follow?

Aside from pleasure what benefits accrue from rowing? Swimming? Tennis? Skating? etc.

How do the schools regard this subject? What are some of the late developments along this line?

Compare the games of ancient with those of modern days in their effect on health, intellect and morals of the nation.

Mention games whose chief instrument is the ball, boat, gun, horse, etc.

What are some of the far-reaching effects on a nation whose people engage in outdoor recreation?

Are interest and enthusiasm necessary in what is known as gymnastics in our common schools? Why?

"To impose on a child to get by heart a long scroll of phrases without any ideas is a practice fitter for a jackdaw than for anything that wears the shape of a man."

A little library growing larger every year is
an honorable part of any child's history.
—*Henry Ward Beecher.*

Biography

We now call your attention to a department of school work which appeals to every true teacher and to every wide-awake boy and girl, the department of Biography. The educators who planned this work realize how intensely interesting the lives of great men and women are to young people, in fact to every one.

We include with these biographies portraits of many of these eminent people whose unselfish lives must forever remain an inspiration to others.

Particular attention has been paid to adapting it to the wants of American readers and of the present time. It will be found that many names are included of persons recently brought into prominence who are the subject of daily inquiry in this country but of whom no mention can be found in the more pretentious and bulky reference works.

We give over 3,500 biographies. It has been the endeavor of the editor to make the collection so complete that this biographical information will answer every demand made upon it by the student, and the great extent of the work makes it possible in this course to merely indicate a brief classification which if chronologically arranged would present a history of human activity in the field of art, literature and science.

In the following biographical outline we have merely noted a few names in connection with the classification. This list may be added to as you refer to The New Practical Reference Library. In the biographies you will find the most salient points in each career have been touched, and no person can arise from a perusal of such lives without feeling his whole mind and heart made better and his best resolutions strengthened; thus it is impossible to say where a good example may not reach, or where it will end, if indeed it have an end.

Classified List

Actors—Garrick, Irving, Booth, Bernhardt, Mansfield, Marlowe, Adams.

Adventurers and Discoverers—Columbus, Abruzzi, Cortez, Livingstone, Magellan, Stanley, Drake, Kidd, Peary, Nansen.

Alchemists—Agrippa, Bacon, Paracelsus, Lavoisier, Priestly.

Americans, Great—Franklin, Henry, Washington, Lincoln, Garfield, Lee, McKinley.

Anti-Slavery Leaders—Wilberforce, Garrison, Phillips, Fremont, Stanton.

Artists—Giotto, Schnorr, Ruysdaal, Copley, West, Vinci.

Astronomers—Herschel, Tycho Brahe, Kepler, Newton, Young, Halley, Laplace, others.

Authors—Homer, Dante, Luther, Shakespeare, Chaucer, Bacon, Milton, Goethe, Cervantes, Scott, Dickens, Tennyson, Kipling, Irving, Bryant, Longfellow, Howells, Twain, Riley, Aldrich, others.

Bible Characters—David, Jews, Paul, Moses, Jesus, God, Abraham, John, etc.
Botanists—Huxley, Tyndall, Humboldt, Burbank, Pliny, Ray, Linnæus, Brown, Gray.
Chemists—Priestly, Cavendish, Dalton, Humboldt, Faraday, Professor and Madam Curie, Pasteur.
Colonists—Drake, Raleigh, Smith, DeSoto, Balboa.
Confederate Statesmen—Davis, Stephens, Breckenridge, Benjamin, others.
Determination, Men of—Palissy, Galileo, Burritt, Carlyle, Bunyan, Arkwright.
Diligence, Men of—Buffon, Jenner, Franklin, Wellington, Irving.
Divines—Abbott, Beecher, Campbell, Moody, Parker, Sankey, Talmage, Hillis, Gunsaulus.
Dramatists—Jonson, Dumas, Schiller, Æschylus, Ibsen.
Englishmen, Great—Grey, Elizabeth, Cromwell, Anne, Pitt, Victoria, Gladstone, Balfour.
English Writers—Bacon, Chaucer, Caxton, Gibbon, Ruskin, Tennyson.
Financiers—Patterson, Rothschild, Morris, Gage, Morgan, Carnegie, Sage, Rockefeller, Shaw.
Historians—Plutarch, Herodotus, Macaulay, Gibbon, Parkman, Guizot, Hume, Bryce.
Illustrators—Darley, Nast, Cruikshank, McCutcheon, others.
Integrity, Men of—Diogenes, Burke, Arnold, Jackson, More, Wilberforce.
Inventors—Davy, Fulton, McCormick, Vinci, Edison, Marconi, Tesla, Maxim, Noble.
Journalists—Franklin, Greeley, Bennett, Dana, Watterson, Young, Pulitzer, Medill.
Kings—Charlemagne, Cæsar, Alexander, Bonaparte, Henry VIII, George III, Edward VII.
Lawyers—Moses, Confucius, Lycurgus, Blackstone, Webster, Solon, Knox, Choate.
Librarians—Poole, Spafford, others.
Logicians—Mill, Hegel, Kant, Leibnitz, others.
Mathematicians—Pythagoras, Archimedes, Legendre, Newton, Gunter, Lord Kelvin.
Merchants, Famous—Law, Hudson Bay Co., Astor, Girard, Morris, Wanamaker, Field.
Missionaries—Xavier, Elliot, Moffat, Livingston, John the Baptist, Jesuits.
Musicians—Patti, Lind, Beethoven, Mendelssohn, Strauss, Paderewski, Wagner, Mozart, Kubelik.
Noble Motives, Men of—Lincoln, LaFayette, Garrison, Whittier, Greeley.
Novelists—Balzac, Andersen, Bjornson, Cooper, Dumas, Tolstoi, Stevenson, Eliot, others.
Orators—Demosthenes, Cicero, Burke, Henry, Webster, Beecher, Bryan, Beveridge.
Painters—Michelangelo, Titian, Rembrandt, Raphael, Correggio, Burne-Jones, Whistler, Sargent, Murillo, others.
Patience, Men of—Columbus, Hampton, Raleigh, Kossuth, Audubon, Harvey.
Patriots—Bruce, Washington, Moore, Pitt, Gladstone, Davis, Kosciusko, Joan of Arc.
Philanthropists—Barnardo, Childs, Cooper, Durant, Hirsch, Girard, Peabody.
Physicians—Hahnemann, Virchow, Harvey, Pasteur, Senn, Lorenz.
Political Economists—Mill, Martineau, Franklin, Bagehot.
Preachers—Chrysostom, Kempis, Xavier, Wycliffe, Wesley, Spurgeon, Moody.
Precision, Men of—Poussin, Cuvier, Titian, Brougham, Pope, Disraeli.

PRESIDENTS—(See list, page 320.)
PRINTERS—Gutenburg, Caxton, Elzevir, others.
PRISONERS' FRIENDS—Vassar, Howard, Fry, Nightingale.
PSYCHOLOGIST—Aristotle, Berkely, Cousin, Hegel, Hume.
REFORMERS—Stanton, Anthony, Blackwell, Bloomer.
RELIGIOUS LEADERS—Wycliffe, Luther, Calvin, Abbott, Parkhurst.
RULERS—Alexander, King Edward, Loubet, Diaz, Nicholas II.
SCIENTISTS—Harvey, Gesner, Ray, Buffon, Cuvier, Agassiz.
SCULPTORS—David, Raphael, Hosmer, Powers, Greenough, Donatello, Thorwaldsen, Phidias, Bartholdi, Saint Gaudens.
SOCIAL REFORMERS—Adler, Bradlaugh, Gerry, Debs, Addams.
SOLDIERS—Hannibal, Cæsar, Cromwell, Grant, Jackson, Lee.
STATESMEN—Bolingbroke, Bismarck, Davis, Gladstone, Lincoln, Blaine.
TEACHERS—Quintillian, Erasmus, Pestalozzi, Mann, Murray, Parker.
TEMPERANCE ADVOCATES—Gough, Willard, others.
THEOLOGIANS—Zwingli, Luther, Xavier, Huss, Campbell, Beecher.
WARRIORS—Washington, Bonaparte, Alfred the Great, Charlemagne.
WOMAN SUFFRAGISTS—Stanton, Mott, Anthony, Bloomer.
YOUNG MEN, GREAT—Handel, Haydn, Mozart, Cervantes, Pope.

Famous Women

Among the many famous women whose biographies are included in THE NEW PRACTICAL REFERENCE LIBRARY we submit the following list for your study:

Adams, Maude.
Addams, Jane.
Alcott, Louisa May.
Anthony, Susan B.
Aspasia.
Austen, Jane.
Barton, Clara.
Bernhardt, Sara.
Bonheur, Rosa.
Bremer, Fredrika.
Bronte, Charlotte.
Browning, E. B.
Burdett-Coutts, Baroness.
Cary, Alice and Phoebe.
Catharine de Medici.
Catharine, Empress.
Cenci, Beatrice.
Christina, Queen.
Corday, Charlotte.
Dudevant, Mme.
Eliot, George.
Elizabeth, Queen.
Gould, Helen.
Grey, Lady Jane.
Howe, Julia Ward.
Hypatia.
Lind, Jenny.
Joan of Arc.
Marlowe, Julia.
Marie Antoinette.
Maria Theresa.
Nightingale, Florence.
Ossoli, Margaret Fuller.
Patti, Mme.
Pocahontas.
Roland, Mme.
Sappho.
Stael, Mme. de.
Stowe, Harriet B.
Victoria, Queen.
Ward, Mrs. Humphry.
Washington, Martha.
Wilhelmina, Queen.
Wilkins, Mary.
Willard, Frances E.

QUESTIONS.

How old was Queen Victoria when she ascended the throne? How many years did she reign? When and at what age did she die?

At what age did Wilhelmina become queen of the Netherlands?

In what field of labor did Frances Willard become world famous? Where was she born? Educated?

Was Emma Hart Willard, who wrote "Rocked in the Cradle of the Deep," related to Frances Willard?

What are some of the principal productions from the pen of Mrs. Humphry Ward?

What was George Eliot's real name? In what story does she portray her girlish personality? At what age did she marry?

What names have made the reign of Elizabeth one of the most famous literary periods of all time?

What national association was organized by Susan B. Anthony? Who worked with her in this movement?

What painting by Rosa Bonheur was purchased for $55,000 by Cornelius Vanderbilt?

Of what descent is Sarah Bernhardt? By whose wish was she baptized into the Christian faith?

In what year did Louisa M. Alcott write her famous "Little Women"?

What poem by Elizabeth Barrett led to her marriage to Robert Browning?

For what work is Jane Addams famous?

In what production did Maude Adams score a great success and win much of her present fame?

What famous hall was presented to a great university by Helen Gould?

For what are Alice and Phœbe Cary celebrated?

Who was Hypatia? What led to her brutal murder by the clergy?

When and where was Julia Marlowe born?

QUESTIONS—BIOGRAPHY.

Actors and Dramatists.

How is Henry Irving regarded as an actor?

Of what nationality is Ellen Terry? How does she rank as an actress?

In what world-famous play did Joseph Jefferson take the leading part? How is he regarded by the American people? What is his rank as an actor?

In the presentation of what plays did Edwin Booth win fame?

What is the nationality of Bernhardt? For what lines of work is she noted other than acting?

What are the principal dramas of Shakespeare presented today?

Artists.

How does Rosa Bonheur rank as an artist? When did she die?

What was the last and unfinished painting of Raphael?

Is Dante Rossetti more famous as a poet or painter?

How many paintings has Rubens produced?

What picture by Titian has been described as faultless?

What are Raphael's greatest works? Name three.

What is Vandyck's rank among portrait painters?

For what extraordinary sums were Rembrandt's "Coppenol" and "Jesus Before Pilate" sold?

What sculptor made the statue of "Liberty," overlooking New York harbor?

Business and Industrial.

Over what immense number of miles of railway was Jay Gould once in command?

What great sum was paid by Barnum for "Jumbo," the huge elephant?

Who is James J. Hill? What has he accomplished in his line of work?

What can you say of Alfred Krupp? For what is he noted?

What is the record of Marshall Field along commercial lines?

At what age did Rockefeller enter business and when did he become head of the Standard Oil Company?

Discoverers and Explorers.

What famous search mission was undertaken at the suggestion and expense of James Gordon Bennett?

How did it happen that the new continent was named after Amerigo Vespucci?

Where did Andree start on his balloon expedition to the North Pole? What was the result?

In what cool way did Balboa appropriate the Pacific?

What were the education and the early tastes of Christopher Columbus?

Which was the most famous of Drake's voyages?

How was Vasco da Gama rewarded by the Portuguese government for being the first to round the Cape of Good Hope?

How did Livingstone and Stanley divide the field of discovery?

What was the farthest northern point reached by Nansen?

What are the dates of Peary's three Arctic expeditions?

From what very humble origin did Livingstone make his way to fame?

Name some of the notable events in the career of Daniel Boone.

Educational.

What is the rank of William R. Harper as an educator?

Along what lines is Booker T. Washington working in the education of the negro?

Of what subject was Frances Willard a professor in Northwestern University?

For what is Euclid noted? Sir Isaac Newton?

What was the original endowment fund of the Astor Library, and what is the size of the library?

For what is Leland Stanford's name noted?

How did Aristotle believe happiness is attained?

What was the great good in life and the great evil according to Epicurus?

For what is William T. Harris distinguished?

Of what famous university is Arthur T. Hadley the head?

Of what university was James B. Angell president?

What is the plan of the Carnegie Institution? Where is it located?

Who founded Harvard University and when?

Who was Horace Mann? Francis Parker?

Who is the president of Harvard University?

Historical.

At what unusual age did George Bancroft graduate from college and receive his doctor's degree?

What were the various stages of emancipation?

From what social class was Washington descended and how long had his family been in America?

Where did Croesus obtain his proverbial wealth?

Who was Aurelius Antoninus?

What was the career of Caius Marius?

What is the story of Romulus and Remus?

For what was Alfred the Great especially noted?

When did Kitchener leave the Sudan?

What was the unusual combination of characteristics in Tiberius' reign?

Who were the parents of Frederick Douglas and what was his early mode of life?

Who was the first premier of the Dominion of Canada?

What was the far-reaching object of Lycurgus?

What repeated penalties did William Penn suffer for his Quaker opinions?

For what parliamentary acts was Sir Robert Peel celebrated?

What were the great events in Oliver Cromwell's life?

Who was Chinese Gordon or Gordon Pasha?

Who was Robin Hood?

What is the story of William Tell?

What Presidents of the United States have been assassinated?

Inventors.

Where was the first locomotive engine made in the United States and from whose plans was it constructed?

How is the story of Thomas Edison's life typically American?

What is the great invention of George Westinghouse?

What American ship famous in the Civil War was invented by Ericsson? What effect did it have on naval warfare?

When did Howe invent the sewing machine?

What machine invented by Eli Whitney has been the means of the saving and making of millions of dollars every year?

Is Bell, the inventor of the telephone, still living?

Who is Marconi? What is his important discovery?

Literature.

(For more extended list of writers and authors see Literature.)

What is regarded as Victor Hugo's best novel?

Of what nationality is Tolstoi?

What is the nature of Mark Twain's writings?

Who is Ralph Conner? What are some of his best books?

For what was Louis Honore Frechette noted? Name three other Canadian poets.

Why is Edward Everett Hale called "the American Defoe"?

Of what nationality was Ibsen? Tell of his life and works.

By what trade did Whittier support himself when at school?

Religious.

At what early age did Moody begin his evangelical work?

In what capacity has Dr. Parkhurst earned his fame as a social reformer?

What life did Peter the Hermit lead after the Crusades?

For what is Robert Raikes noted?

For what is Emil G. Hirsch famous?

Who was John Huss? What noted article did he write?

What was the appearance and personality of Phillips Brooks?

Who protected Calvin after he had turned heretic to the Roman Catholic faith? How did the Calvinist sect arise?

How did the term "Quakers" originate?

What famous duel was made the subject of one of Lyman Beecher's most noted sermons?

Of what religion was Zoroaster the founder?

Of what famous educational movement was Bishop Vincent the founder?
Who was Savonarola?
To what form of religion did Voltaire hold in denouncing Christianity?
In what way was the Society of Jesuits formed?
When did Leo XIII become pope and how many years was he at the head of the Roman Catholic church?
For what is Bishop Ireland noted? Bishop Spalding? Cardinal Gibbons?
What distinction did the Methodist Episcopal church bestow upon Francis Asbury?
Who was the founder of the Church of Christ, Scientist?
At the head of what great religious and charitable movement is William Booth?

Musicians.

What rank does Jan Kubelik take as a violinist?
From what common affliction did Handel and the poet Milton suffer?
To what king was Mendelssohn appointed musical director?
What honor was conferred upon Mozart at the age of six?
What is Mme. Nordica's nationality? What is her rank as a singer?
When was Sousa's band first organized?
For what is Antonio Stradivarius noted?
Thomas was the musical director in what noted fair?
From what did Wagner select his subjects?
How is Chopin pronounced?

Military and Naval.

In what war did Grant serve in every battle but one?
In what tragic way did Montezuma bring death upon himself?
What did General Grant owe to Richard Yates?
Where was General Custer defeated and killed and what commemorates the spot?
What part did Rear Admiral Schley play in the war with Spain?
When did Dewey become an admiral?
When did General Weyler leave Cuba?
When did Funston capture Aguinaldo?
Who is Captain Dreyfus? What persecutions has he been subjected to and why?
Who commanded the Invincible Armada?
In what famous battle were the Confederate forces successful under the leadership of Bragg?
What Japanese leaders won fame in the Russo-Japanese war? What Russian leaders?
In what lay Lee's wonderful military genius?

Miscellaneous.

For what is Lyman Abbott noted?
What is the Hall of Fame? Names of what noted Americans have been inscribed? What are the conditions imposed?
Who is Luther Burbank? What is his particular line of work?
How does Hull House rank among the institutions of its kind in the United States? Who is at its head?
For what was Henry George noted? To what extent, if any, have his ideas been adopted?

Sir Christopher Wren restored what celebrated cathedral?
How did Chester A. Arthur serve in the Civil War?

Philanthropists.

What is the wide range and importance of George Peabody's philanthropic work?
What famous simile did John Locke make in describing the human mind?
What enormous gifts of money have been donated by Carnegie and for what purposes?
What were some of the contributions of George Peabody in the cause of education? What is the Peabody Educational Fund?
What is the college founded by Stephen Girard to which ministers are denied entrance? Where is it located?
How many boys and girls were educated by George William Childs?
What generous aid did Cecil Rhodes give to the Irish Home Rule cause?

Philosophers.

In what direction has Hegel's philosophy made itself most powerfully felt?
What was Plato's philosophy? Who were the Seven Wise Men?
What system of reasoning did Sir Francis Bacon advocate?
What system of philosophy did Auguste Comte found?
What was Socrates' method of arriving at the truth?

Political.

For what reason did McKinley receive more than the average vote of his party in 1896?
For what was Cleveland's second administration memorable?
At what very early period did Martin Van Buren enter political life?
How did James A. Garfield's unexpected nomination for the presidency come about?
In what dramatic episode was Henry M. Teller the leader?
Was Mark Hanna largely responsible for placing McKinley in the presidential chair?
How many years has Joseph G. Cannon served in Congress?
Of what party was John C. Breckenridge once the candidate for the presidency? What was his rank in the Confederate army?
How many times was Henry Clay defeated for the presidency? What is his famous saying in this connection?
When did Chauncey Depew retire from a railroad presidency?
Give an account of the public career of Theodore Roosevelt.

Rulers.

Who is the present Sultan of Turkey?
For what reasons was Marie Antoinette unpopular with the French populace?
When was the title "Empress of India" conferred upon Queen Victoria?
Who is the present king of Denmark? Of Norway? Whom did the latter succeed?
Who was the father of Queen Christina of Sweden and who directed her unusually broad education?
Which of the Russian rulers named Ivan was called "The Terrible"?
Who was the greatest king of Scotland, and why?

Over what celebrated woman did Mary I triumph in ascending the throne?
What is the meaning of "Hapsburg"?
Who is the present ruler of Holland?
Who was Queen Elizabeth's mother?
Who is the sultan of Turkey? Tell of his relations with other countries.
Why was George IV given the nickname of "First Gentleman of Europe"?
What are the characteristics of the czar of Russia?

Statesmen and Orators.

In what two cabinets has Horace Porter served?
When did John Sherman resign his position as secretary of state?
Who was at the head of the war department during Lincoln's administration?
What principle dominated Webster through all his political life?
What was Gladstone's public career?
How long was Lord Rosebery premier of England?
Compare personal characteristics of Roosevelt and McKinley.
How is John Hay regarded as a diplomat?
Who was Paul Kruger? For what principles was he fighting? What were his characteristics?
Who was Ito? What did he do for his country? In what way did the United States help him?
What were the leading characteristics of Webster?
What relation to Napoleon is former Secretary of the Navy Bonaparte?
Who is La Follette? For what work is he prominent?
What speech resulted in the nomination of Bryan to the presidency in 1896?
What were some of the characteristics of Beecher as a speaker?

Patriotic.

In what way did Congress make recognition of LaFayette's services?
What is the interesting memorial in honor of Kosciusko?
Who was Robert Emmet? For what was he executed?
What part in affairs of Colonial times did Patrick Henry take? What is his famous saying?
For what was Joan of Arc noted?
In what way did Florence Nightingale serve her country?
Who was James Lawrence? When did he utter the famous words: "Don't give up the ship"?

Scientific.

For what is Pasteur noted? Professor and Madam Curie?
By whom was radium discovered?
What is liquid air and its uses? Who has been the most successful experimenter with it?
What are the principles on which the thermometer works? The barometer? Who invented each?
Who is Hiram Maxim and for what is he noted?
What deadly explosive was invented by Alfred Nobel? What are the Nobel prizes?

All that mankind has done, thought, or been is lying as in magic preservation in the pages of books. —*Carlyle.*

Botany

To enable the student to use intelligently the systematic and classified index embodied in THE NEW PRACTICAL REFERENCE LIBRARY, we supply herewith an outline on BOTANY which includes only those titles actually reached by way of the title BOTANY. To make the matter clear: If a person reads the article on BOTANY he would be referred to the article on PLANTS. When he reads the article on PLANTS he will be referred to the articles on STEMS, LEAVES, FRUITS, etc. He may then return to the article BOTANY, and will find a cross reference to CLASSIFICATION. Under CLASSIFICATION he will find cross references to GENUS, SPECIES and VARIETY. When he has read these he will return to the article BOTANY, find articles on SLIME MOLDS, DIATOMS and BACTERIA. In the last named he will find references to PUTREFACTION, FERMENTATION, etc., with a reference which leads into MEDICINE. Running down the page to cross reference 14, you will note CONIFERÆ. Under this the several important cone-bearing trees are mentioned by name. Note that under PINE you will be led into the products of pine, which carries you into LUMBER and FORESTRY, where you might find still further cross references.

A systematic outline like this on BOTANY shows to the eye very clearly what a valuable and thorough-going index we have in our cross references and how very interesting research work may become by using THE NEW PRACTICAL REFERENCE LIBRARY.

BOTANY.

1. Plant
   - (a) Stems
   - (b) Leaves
   - (c) Fruits
   - (d) Flowers
   - (e) Pollen
   - (f) Seeds
2. Classification
   - (a) Order
   - (b) Genus
   - (c) Species
   - (d) Variety
3. Slime Molds
4. Diatom
5. Bacteria
   - (a) Putrefaction
   - (b) Fermentation
   - (c) Antiseptics
   - (d) Germ Theory of Disease
   - (e) Medicine
6. Molds
7. Rusts
8. Yeasts
9. Algae
10. Lichens
11. Mosses
12. Ferns
13. Club Moss
14. Coniferae
    - (a) Cypress
    - (b) Fir
    - (c) Hemlock
    - (d) Larch
    - (e) Pine
      - (1) Tar
      - (2) Turpentine

(3) Forests
(a) Forestry
(4) Lumber
(a) Saw
(f) Sequoia
(1) Redwood
(g) Spruce
(h) Yew
15. Cycads
16. Grasses
17. Palms
(a) Cabbage Palm
(b) Cocoanut
(c) Date
(d) Doum Palm
(e) Ivory Palm
(f) Palmetto
(g) Palmyra Palm
(h) Sago
(i) Talipot Palm
18. Lily Family
19. Orchids
20. Cruciferae
(a) Mustard Family
21. Leguminosae (Pulse Family)
(a) Indigo
(b) Peanut
(c) Bean
(d) Cassia
(e) Acacia
(f) Clover
22. Labiatae (Mint Family)
23. Compositae
(a) Arnica
(b) Aster
(c) Chrysanthemum
(d) Dahlia
(e) Daisy
(f) Goldenrod
(g) Lettuce
(h) Tansy
(i) Thistle

Flowers

I. Uses.
1. Primary.
a. Produce seeds.
2. Secondary.
a. Beautifying earth.
b. Commercial purposes.

II. Parts.
1. Calyx.
2. Corolla.
3. Stamens.
a. Filament.
b. Anther.
c. Pollen.
4. Pistils.
a. Ovules.
b. Stem-style.
c. Stigma.

III. Variations.
1. Construction.
2. Forms.
3. Colors.

IV. Cultivation.
1. Methods.
a. Landscape gardening.
b. Conservatories, hot houses.
c. Nurseries, etc.

V. National and State Flowers.
1. Significance.
a. Denote feelings and characteristics of nations.
b. Influence.
2. Countries.
a. United States.
b. Foreign countries.

VI. Language of Flowers.

VII. Commercial.
1. Manufacture of artificial flowers.
2. Supplying markets with shrubs and flowers.

VIII. Colored Plate.

QUESTIONS.

What is the great fact in the life of the flower?

Why is it necessary that birds and insects should be attracted to the flowers? By what means are birds and insects so attracted?

From the color plate illustrating flowers, how many varieties do you find common to your garden? To your nearest greenhouse?

Name and describe a dozen different kinds of flowers of your neighborhood.

How many thousand species of orchids are known?

Where do orchids grow wild in the forests?

What are some of the peculiar shapes of orchids?

What city leads in the manufacture of artificial flowers?

Just from your everyday observation, for what would you say artificial flowers were most generally used?

When and where did the Language of Flowers originate?

What is your state flower?

What is the calyx?

Why is the corolla usually highly colored?

Where do you find the pollen in the flower and of what use is it?

From what country does the lotus come?

What do the natives of India believe of the lotus?

What flower is the emblem of Persia?

What country has the fleur de lis for a national flower?

What is the national flower of the United States? How and when was it selected?

What flower often assumes the forms of reptiles and insects?

From what plant do we get the vanilla?

What flower is the emblem of Japan?

How are the state flowers adopted?

What is the state flower of West Virginia? Of Louisiana? Of Indiana? Of New York? Of Kansas?

What species of the chrysanthemum are common weeds in Britain?

Of what was the daisy the emblem in the days of chivalry?

What is the universal significance of the forget-me-not?

What is the popular name of geranium?

What ancient people sent holly with New Year's gifts as emblems of good will?

Where has ivy been held sacred?

Narcissus, according to the Greeks, was changed into what flower?

What kind of plant is the sun dew?

Of what was the myrtle an emblem at Athens?

QUESTIONS—BOTANY.

Who is the Father of Botany?

In what way did Darwin's theories and discoveries revolutionize botany?

Of what plant in particular did he make a study?

What is pollen? Why is it produced in such abundance? How do insects help in the fertilization of flowers?

What are some of the methods by which seeds are scattered? Why are they produced in such abundance?

What are parasites in the plant world? Give examples.

Give uses of the following to plant life and describe their functions: Roots, stems, leaves, flowers.

What instrument aids materially in the study of botany?

Why are leaves arranged on a plant in a certain order and always to what end?

What is chorophyll? What important work does it do for the plant? What is meant by saying plants take in carbonic acid gas and give off oxygen?

What is meant by germination? Upon what does it depend?

How many different species of palms are there? What are their main characteristics? Name three well-known varieties.

What is the meaning of the word "coniferæ"? Describe the general characteristics of the pine family.

What foods are produced by the leguminosæ order?

What common vegetables are produced by the mustard family or cruciferæ?

Of what aid are bacteria to plant life? What injury?

Where are lichens found in greatest variety? What is their chief use? Describe their growth.

What are fungi? Characteristics? Number of species?

How many known species in the family compositæ? Of what do they consist?

What are the principal uses of moss? Where grown?

Why are orchids favorite plants? Where are they found?

How do the following injure the plant: Molds, rusts, fungi, etc.?

What are cotyledons? Dicotyledons? Monocotyledons?

What is known of the diseases of plants? What havoc do insects and worms play in the plant world?

INTERESTING FACTS.

Plants absorb water through their roots, and give it off through their leaves. The amount of water absorbed and given off is almost beyond belief.

In order to prevent wilting, the rise of sap during the life of the leaf must have kept pace with the evaporation from its surface. The total amount of water that travels through the roots, stems, and leaves of most seed-plants during their lifetime is large, relative to the weight of the plant itself. During 173 days of growth a corn-plant has been found to give off nearly 31 pounds of water. During 140 days of growth a sunflower-plant gave off about 145 pounds. A grass-plant has been found to give off its own weight of water every twenty-four hours in hot, dry summer weather. This would make about 6 1/2 tons per acre every twenty-four hours for an ordinary grass-field, or rather over 2,200 pounds of water for a field 50x150 feet, that is, not larger than a good-sized city lot. Calculations based on observations made by the Austrian forest experiment stations showed that a birch tree with 200,000 leaves, standing in open ground, transpired on hot summer days from 700 to 900 pounds of water, while at other times the amount transpired was probably not more than 18 to 20 pounds.

Meadow hay contains about two per cent of potash, or 2,000 parts in 100,000, while the soil-water of a good soil does not contain more than one-half of one per cent. or one-half part in 100,000 parts. It would therefore take 4,000 tons of such water to furnish the potash for one ton of hay. The water which the root-hairs take up must, however, contain far more potash than is assumed in the calculation above given, so that the amount of water actually used in the growth of a ton of hay cannot be much more than 260 tons.

The mind that is unfed is also unstored.—*E. P. Whipple.*

Chemistry

That we should have at least a practical knowledge of the elements necessary to life, the air we breathe, the food we eat, will go unquestioned. An elementary knowledge of chemistry is of prime importance to the housewife, to the farmer, and the layman in every walk of life. The science of chemistry enters into every branch of study.

The boy with an active mind has inquired the cause of cream forming on milk; he wonders what causes gas to burn: smoke to rise: water to freeze: how matches are made; in fact he is daily confronted with subjects on which his mind hungers for enlightenment. He should have means of appeasing and at the same time developing this natural appetite. To form the habit of looking up daily such subjects will lay a permanent foundation to a broad, practical education.

In the preparation of The New Practical Reference Library this idea was constantly kept in mind, and throughout the work will be found an inexhaustible fund of such information, written in simple, clear language. In the accompanying outline no effort has been made to go into detail. A brief list of related subjects is appended. The student will find hundreds of others. It must be borne in mind that the value of this course of study, as any other, lies in the fact that the user is led to search for the knowledge sought and is only rewarded when honest effort has been made.

CHEMISTRY.

What is chemistry? Of what does it treat?

History.

Alchemy (which see).

Objects.

Prolongation of life.

Transforming baser metals into gold.

Egypt.

Arabia.

Europe.

Results.

Paracelsus—Discovered preparation of drugs.

Lavoisier, Priestly, Scheele } By use of balances established modern ideas of chemistry.

Great Chemists (which see).

Sir Humphrey Davy	Faraday	Pasteur
Berzelius	Gay-Lussac	Priestly
Bacon	Lavoisier	Others
Boyle	Liebig	

Is chemistry an ancient or modern science?

What was alchemy? What were its two chief objects? What science did the study of alchemy develop?

In what ancient country is it thought the study of alchemy began?

What alchemist developed the manufacture of drugs, and when?

What other students of alchemy by the use of balances laid down the principal ideas of modern chemistry?

SUBSTANCE.

Element—Define.

Examples.

Aluminum.	Copper.
Arsenic.	Gold.
Calcium.	Iron.
Carbon.	Lead, etc.

Compound—Define.

Chemical affinity.

Atomic theory.

How many elements were known to chemistry in 1906?

What is the force called that holds elements together in the form of compounds? What other action does this force bring about?

What is an atom? A molecule? Is a drop of water an atom or a molecule? Why?

LAWS OF CHEMICAL COMBINATION.

Effect a change of

State.	Volume.
Temperature.	Taste.
Color.	Smell.

Affected by

Heat.	Electricity.
Light.	Mechanical force.

When does chemical combination take place between molecules? Give an example.

Does chemical combination take place with different degrees of force in different bodies?

What is peculiar about the combination of all substances as regards weight and proportions?

How do gases combine?

NOMENCLATURE.

Endings applied to

Metals—

um.

Compounds—

ide. ous. ic. ite. ate.

To what do some elements in chemistry owe their names?

What is the modern custom of naming metals? Compounds? Give example.

Do the names of many compounds denote their composition? Give three examples.

When does the name of an element end in *ous*? In *ic*?

SYMBOLS.

Used to represent

Elements.

Compounds.

Chemical reaction.

BRANCHES OF CHEMISTRY.

Organic.	Industrial chemistry.
Inorganic.	Physical chemistry.
Agricultural.	Thermochemistry.
Electrochemistry.	

Some of the many related subjects are here listed. These will be found in THE NEW PRACTICAL REFERENCE LIBRARY:

Hydrogen	Ice	Ozone	Paints	Soda	Coal-tar
Nitrogen	Zinc	Cobalt	Phosphorus	Oils	Dyeing
Oxygen	Gold	Nickel	Aluminum	Alum	Gums
Potassium	Silver	Sulphur	Tin	Acids	Resins
Water	Iron	Radium	Borax	Brass	

QUESTIONS—ELEMENTARY CHEMISTRY.

How do you account for carbonic acid gas being poisonous to the lungs but pleasant and stimulating to the stomach?

What is soda water? With what is it charged?

How is the cream on milk formed?

From the bark of what tree is quinine made? When was it discovered? For what ailments is it helpful?

What is chloroform? When and by whom was it discovered? When and by whom was it first used as an anesthetic? How is it administered? What are its effects?

For what is ether extensively used?

Name some of the remarkable and valuable discoveries made by Sir Humphrey Davy.

What is ozone? Where does it exist? When is its odor noticed?

How is opium used in certain countries as an intoxicant? Under what name is it commonly used in medicine? Describe it in its natural state. From what country is the principal supply obtained? What beautiful flower in your own garden produces it?

What are some of the most common food adulterants? Name five?

How and from what is gunpowder made? What ancient people used it? When was it first used in war?

Does German silver contain any silver in its composition?

What is the difference between powder used for rifles and that used for blasting and for cannon?

What is smokeless powder? Who discovered dynamite? Nitroglycerin? Guncotton? Which has the greater explosive power, nitroglycerin or dynamite?

What is sulphur? Is it a vegetable or mineral? Where is it found? What are its principal uses?

What is substituted for sulphur in matches?

When were matches first used? How were they lighted?

How can you detect the presence of ammonia and alum in baking powder?

What part of air is oxygen? Nitrogen? Do these gases unite?

NOTE.—How large is an atom? Lord Kelvin says: "If we raise a drop of water to the size of the earth and raise the atom in the same proportion, then it will be some place between the size of a marble and a cricket ball." John A. Brashear in an address delivered at Lehigh University not long ago added: "If you fill a tiny vessel one centimeter cube (smaller than a thimble) with hydrogen corpuscles, you can place therein, in round numbers, five hundred and twenty-five octillions (525,000,000,000,000,000,000,000,000,000) of them. If these corpuscles are allowed to run out of the vessel at the rate of 1,000 per second it will require seventeen quintillions (17,000,000,000,000,000,000) of years to empty it.

What is the atmospheric pressure in tons on the human body of average size? How is this enormous pressure counterbalanced?

Why is milk one of man's most perfect foods?

In the manufacture of illuminating gas, what impurities must be removed? How is coal gas made? Water gas?

How many gallons of vinegar can be made from a bushel of corn?

Oxygen

Properties.

a. Colorless.
b. Odorless.
c. Tasteless.
d. Magnetic.
e. Least refractive.

Occurrence in Nature.

a. Atmosphere.
b. Water.
c. Rocks.
d. Animal tissues.
e. Vegetable tissues.

Uses.

a. In respiration.
b. In illuminating gas.
c. In medical practice.
d. In the oxidation of oils.
e. In manufactures.
f. In the production of heat.

EXPERIMENTS.

Oxygen is easily made for experimental purposes. Take an ounce of chlorate of potash, mix it with a heaping teaspoonful of black oxide of manganese and place the mixture in a flask or bottle in which a cork with a delivery tube can be inserted. Heat gradually over a fire or an alcohol lamp, until the temperature at which the oxygen is liberated is reached. A rubber tube at least three feet long should be attached to the delivery tube. To collect the gas, use glass jars. Ordinary fruit jars will answer the purpose. Fill the jars with water and invert them in a pan of water; then place the mouth of the rubber tube in the neck of a jar, and as the gas escapes it will rise into the jar. When one jar is full, place the tube in another. There should be only a little water in the pan when the experiment begins. The gas will escape very rapidly, and someone should place cards of heavy paper over the mouth of each jar as it fills. Then remove it from the pan and set it in an upright position. The oxygen is heavier than the air, and as long as the paper cover is not disturbed it will remain in the jar.

The following experiments can be easily performed. Take a splinter of wood and ignite it. Slip the cover to one side and insert the wood in the jar. Notice how much more rapidly and brightly it burns than in the air.

Take a small tack, fasten it to a splinter of wood, and drop it in sulphur so as to gather a quantity of sulphur. Ignite it and place in a fresh jar. The tack will burn and throw out brilliant sparks. If you have a discarded main spring of a watch, it will serve the purpose better than the tack, but it must be heated and straightened or the experiment cannot be performed.

Try other substances, and see how many you can find that will burn in oxygen but will not burn in air.

When strong sulphuric acid is dropped upon fragments of brick or pumice-stone, placed in an earthenware or platinum retort and kept at a red heat, the acid is separated into water, sulphur dioxide and oxygen. The products of the decomposition are passed through water, which absorbs the sulphur dioxide and sulphuric acid, and the oxygen is collected over water.

What is put into the first of life is put into the whole life. Start right. —*Colton.*

Civil Government

Few subjects are of greater importance to the boys and girls than a correct understanding of the workings of our governmental machinery.

This subject should be developed from the immediate district or township and a thorough understanding of the primary principles will do much toward an understanding of the subject as applied to nations.

In classes of sufficient size, ideas of government can be practically illustrated by organizing them into caucuses, conventions, courts, etc., by holding elections, creating offices and showing the pupils how to perform the duties thereof.

The schools have given far too little attention to this important subject. Many of the political evils so prevalent are largely due to the fact that Civics is not taught until in the high school or college.

The only way to respect and love the Constitution is to *know* it. Citizens should know the obligations imposed upon them. Electors should realize the importance of their vote; taxpayers should comprehend the use made of their money, and all should be taught to love our country and her laws.

If ideas of true citizenship be early taught and the children are led to appreciate the inestimable birthright of American citizenship, patriotism will be fostered, political corruption checked and wise government well founded.

Constitution

I. Definition—Supreme law of the land.
II. Formation.
    1. Time—September 17, 1787.
    2. Place—Philadelphia.
    3. Manner—By Federal Convention.
    4. Difficulties.
III. Efficiency—Compared with Articles of Confederation.
    1. The central government had more power.
    2. The powers and functions were more widely distributed—legislative, executive and judicial.
IV. Purposes.
    1. To form a more perfect union.
    2. To establish justice.

This outline is developed from the Constitution of the United States. You will find articles on the various subjects in The New Practical Reference Library, but since every one has access to the Constitution it has not been thought advisable to give it space in the Library.

3. To insure domestic tranquillity.
4. To provide for the common defense.
5. To promote the general welfare.
6. To secure the blessings of liberty to the people.

House of Representatives

I. Members.
1. Number—determined by Congress.
2. Term of office—two years.
3. Election—by the voters or electors.
(What is the qualification of electors?)
4. Qualifications.
a. Age.
b. Citizenship.
c. Residence.
d. Official disencumbrance.
5. Apportionment.
a. According to population by census.
b. Conditional—may be reduced if the right to vote is abridged.
6. Vacancies—filled by election.

II. House Powers.
1. Elective.
a. House officers.
b. President of United States.
2. Inquisitorial—originates impeachments.
3. Legislative.
a. Exclusive—has sole power of originating bills for raising revenue.
b. Concurrent—coördinate with the Senate in general legislation.

Senate

I. Members.
1. Number—two from each state.
2. Term of office—six years.
3. Election—by state legislature.
4. Classes.
5. Vacancies.
6. Qualifications.
a. Age.
b. Citizenship.
c. Residence.
d. Loyalty.
e. Official disencumbrance.
7. Presiding officer—decides questions of order.
a. Vice President of United States.

II. Senate Powers.
1. Elective.
a. Vice President.
b. President pro tempore.
c. Senate officers.
2. Judicial.
a. Number necessary to convict—two-thirds present.
b. Judgment in impeachment.

3. Legislative.
4. Executive.
    a. In making appointments.
    b. In making treaties.

III. Elections.
1. Legislatures of states.
2. Congress may regulate except as to place of choosing.

IV. Meeting.
1. Frequency—at least once each year.
2. Time.
    a. By the constitution, first Monday in December.
    b. By law Congress may appoint a different day.
    c. President may call extra sessions.

Provisions Common to Both Houses

I. Membership.
1. Each house judges elections, returns, and qualifications of its own members.
2. Election must be legal, the returns valid and the person must be qualified.

II. Quorum.
1. Number—a majority of each house.

III. Business Rules.
1. Each house may determine its own rules.

IV. Penalties.
1. Punishment—for disorderly conduct.
2. Expulsion—by two-thirds vote.

V. Journal.
1. Kept by each house.
2. Publication.

VI. Yeas and Nays.
1. Entering.
2. Manner of taking.
3. Objects.

VII. Adjournment.

VIII. Salaries.
1. Amount.
2. How paid.

IX. Official Rights—Freedom.
1. From arrest.
2. Of speech.

X. Prohibitions on Members—To Prevent Corruption.

XI. Official Oath.

Powers of Congress

I. Express Powers.
1. To lay and collect taxes.
2. To borrow money on credit of United States.
3. To regulate commerce.
4. To establish a uniform rule of naturalization.
5. To establish uniform laws of bankruptcy.

6. To coin money and regulate the value.
7. To fix the standards of weights and measures.
8. To provide for punishment of counterfeiting.
9. To establish postoffices and post roads.
10. To grant patents and copyrights.
11. To establish inferior United States courts.
12. To have charge of matters related to war.
13. To exercise control over United States territory.

II. Implied and Incidental Powers.
1. To purchase foreign territory.
2. To establish military and naval academies.
3. To make internal improvements.
4. To create corporations.
5. To make all laws necessary to carry into effect all powers.

III. Powers Prohibited and Restricted.
1. To suspend the writ of habeas corpus.
2. To pass a bill of attainder.
3. To pass an ex post facto law.
4. To lay direct taxes unless in proportion to the census.
5. To lay taxes on state exports.
6. To give preference to the ports of one state over those of another.
7. To compel vessels to enter any port other than the one bound for.
8. To draw money from treasury without lawful appropriations being made.
9. To grant titles of nobility.
10. To abridge freedom of speech or of the press.
11. To establish religion or prohibit its exercise.
12. To deny the right of assembling to petition the government.
13. To repudiate debts.

Executive

I. Necessity and Object—To Execute the Laws.
II. Term of Office.
III. Election.
1. By electors.
2. By House of Representatives.
IV. Qualifications—Give a Reason for Each.
1. Birth.
2. Age.
3. Residence.
V. Vacancy in Office of President.
VI. Salary—Fixed by Congress.
1. Payment—monthly.
2. Amount.
VII. Oath of Office.
VIII. Powers and Duties.
1. Commander-in-chief of the army and navy.
2. Commander-in-chief of the militia when in actual service.
3. By and with the advice and consent of the Senate he may appoint many government officials.
4. Fill vacancies occurring during recess of Senate.
5. Grant reprieves and pardons except in cases of impeachment.

6. With the concurrence of the Senate make treaties.
7. Convene either or both houses of Congress if occasion so demands.
8. Recommend such measures to Congress as he shall judge expedient.
9. Receive ambassadors and public ministers.
10. Take care that the laws are faithfully executed.
11. Commission all officers of the United States.

IX. Removal from Office.

The Cabinet Officers

I. Appointed by President with Advice and Consent of Senate.
II. Salary.
III. Members.
1. Secretary of State.
a. Has charge of foreign and domestic relations.
2. Secretary of Treasury.
a. Collects and disburses public money.
3. Secretary of War.
a. Directs the army and military matters.
4. Secretary of Navy.
a. Controls the navy and naval affairs.
5. Secretary of Interior.
a. Manages public lands, education, indians, pensions and patents.
6. Postmaster-General.
a. Has charge of transmitting and distributing mail matter.
7. Attorney-General.
a. Has charge of the legal department.
8. Secretary of Agriculture.
a. Has charge of the agricultural reports and development.
9. Secretary of Commerce and Labor.
a. Has charge of corporations and manufactures, census bureau, immigration, etc.

Judicial Department

I. Objects—To Interpret and Apply the Laws.
II. In What Vested?
1. Supreme Court.
a. Members—Chief Justice and eight Associate Justices.
b. Session—where and when?
2. Inferior Courts—established by Congress.
a. Circuit courts—number?
b. District courts—number?

III. Judges.
1. How chosen?
2. Oath of office?
3. Term of office?
4. Number?
5. Salaries?
6. Removals?
7. Provisions for retirement?

IV. Officers.

V. JURISDICTION.
VI. TRIALS.
1. Civil cases.
2. Criminal cases.
VII. TREASON.

QUESTIONS ON CIVIL GOVERNMENT.

What state has been annexed? (Texas.)

What state had no territorial government before admission? (California.)

Define constitution. Law.

Is a constitution necessarily a written instrument?

Give a distinction between the two kinds of constitutions.

What is the greatest example of a constitution combining and limiting the various departments of government?

What is the object of government?

Name the most common kinds of government.

Where does the government get its power?

What is peculiar of our own form of government?

Name three kinds of colonial governments.

What is the supreme power in the British system of government?

Give an important distinction between the constitution of the United States and the constitution of the states of the Union.

What party was founded on the platform "The constitution of the country, the union of the states and the enforcement of the laws?"

Why did the colonies refuse to be taxed?

What did the first Continental Congress do?

What represented the central government during the Revolution?

Explain the defects in the Articles of Confederation that made the central government weak.

When was the constitution formed? When adopted?

Name the three departments of our government.

What was the Conway Cabal?

What were the Articles of Confederation?

In what is the law-making power vested?

How are representatives chosen?

How is the number of representatives determined? How chosen?

How are the members of the lower house of the state legislature chosen?

What are the qualifications of representatives?

Can a congressman hold any other civil office?

In what years is the census taken?

Are territories allowed representatives in Congress?

How are vacancies in the House filled?

Who is the present speaker of the House?

How are senators chosen? Number and term of office?

CIVIL GOVERNMENT.

NOTE.—Let every American, every lover of liberty, ever well-wisher to posterity, pledge his life, his property and his sacred honor to the support of the Constitution and the laws. —*Abraham Lincoln.*

"Without civic and political education the sovereign people is a child playing with fire, at the risk each moment of burning down the house." —*Pestalozzi.*

Who is president of the Senate? Can he vote? What are the other officers?

What judicial power has the Senate?

Who presides over the Senate when the President is impeached? Why?

What power has Congress concerning elections?

When are representatives elected?

When does Congress meet?

Who makes the final decision as to who are entitled to a seat in either house of Congress?

What constitutes a quorum?

Can absent members be compelled to attend?

What is the power of each house in regard to rules, order, etc.?

What is the rule of adjournment? What was the object of this rule?

Where do senators and representatives get their pay? How much?

Can congressmen be arrested? When? Can suit be brought against them for language used in debate? Why?

Can congressmen fill lucrative offices which have been created during the time for which they were elected?

Can a congressman hold any office under the United States at the same time he is a congressman?

Where do bills for revenue (levying taxes) originate?

Name the general powers of congress.

What prohibitions does the constitution place upon the states?

What are United States bonds?

Can Chinese become citizens of the United States? Why?

What is money? Who fixes the standard of weights and measures?

What is counterfeiting?

How are copyrights obtained? Patents?

Who establishes inferior courts of the United States?

What is piracy? What are letters of marque and reprisal?

What is the limit of appropriations for war?

Of what use is the navy?

What is the difference between the militia and the regular army?

What is an express power? Incidental or implied power?

Name four incidental powers of Congress.

What provisions were made by the constitution concerning slavery?

Define habeas corpus. When has the writ of habeas corpus been suspended? Why? Who has the power to suspend it?

What is a bill of attainder?

What is an ex post facto law?

How must direct taxes be apportioned by the general government?

Why should states be prohibited from forming treaties?

Can a state pass any law impairing the obligation of contracts?

In what is the executive power vested?

Describe the manner of electing the President. What must be his qualifications?

What is the presidential succession law of 1886?

What is the salary of the President?

What oath does the President take?

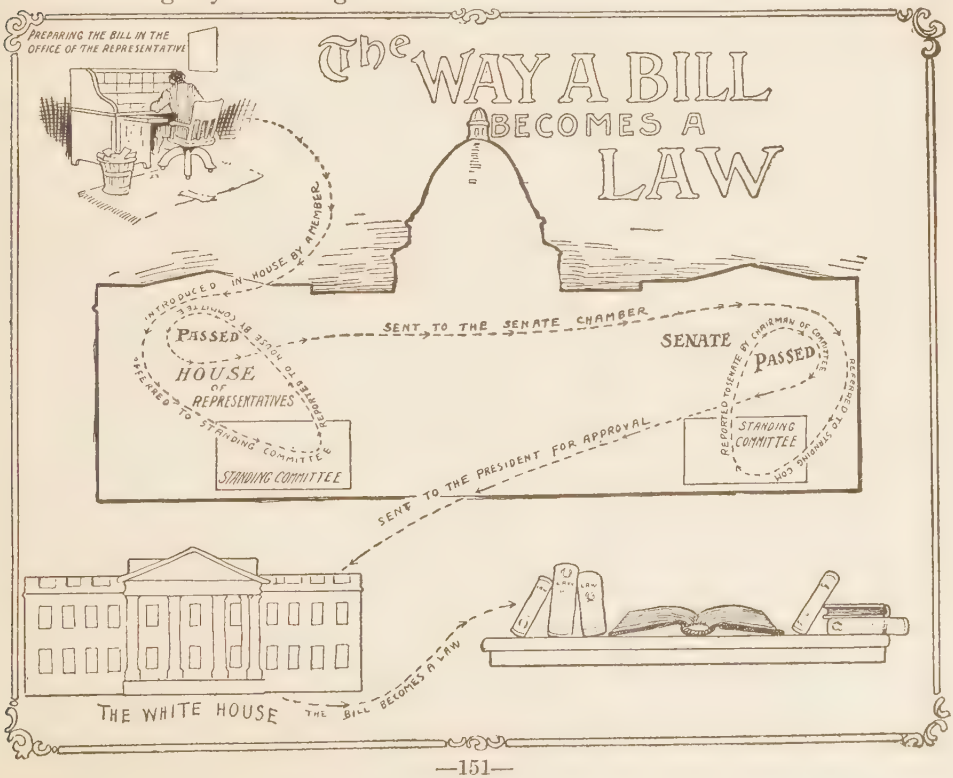
How can the President be removed from office?

How does the President make appointments?

What is meant by "civil service reform?"

What is the President's message?

In what is the judicial power vested?
What inferior United States courts have been established?
Of how many justices does the Supreme Court consist?
How many circuit judges are there?
Can district courts cross state lines?
What is meant by original and appellate jurisdiction?
Who are the citizens of the United States?
Can a person be tried twice for the same crime?
Can private property be taken for public use?
What is treason? What is necessary to convict?
What is the punishment for treason?
Name some of the rights of states.
What is extradition?
What was the "Ordinance of 1787?"
Can the United States acquire territory? How?
What is the relation of a territory to the Union?
Is a state compelled to remain a state?
How was Texas admitted?
What was the condition of the seceded states after the Civil War?
What question did the Civil War settle?
How may amendments be proposed? Ratified?
When does an amendment become valid?
What is the supreme law of the land?
Can a state nullify the laws of the Union?
How was the constitution ratified?
What state was the last one to ratify it?
How many amendments have been made to the constitution?
What is the nature of the first ten amendments?
How many states has the Union? Territories?
How did the United States get all its present territory?
What is gerrymandering?


PREPARING THE BILL IN THE OFFICE OF THE REPRESENTATIVE
The WAY A BILL BECOMES A LAW
INTRODUCED IN HOUSE BY A MEMBER
INTRODUCED IN HOUSE BY COMMITTEE
PASSED
HOUSE OF REPRESENTATIVES
REFERRED TO STANDING COMMITTEE
REPORTED TO HOUSE BY COMMITTEE
STANDING COMMITTEE
SENT TO THE SENATE CHAMBER
SENATE
PASSED
REPORTED TO SENATE BY CHAIRMAN OF COMMITTEE
REFERRED TO STANDING COMMITTEE
STANDING COMMITTEE
SENT TO THE PRESIDENT FOR APPROVAL
THE WHITE HOUSE
THE BILL BECOMES A LAW

ELECTORAL AND POPULAR VOTES OF 1908, COMPARED WITH THOSE OF 1904

State	Elec'l Vote 1908		Elec'l Vote 1904		Popular Vote, 1908											Popular Vote, 1904							
	Taft	Bryan	Roosevelt	Parker	Taft	Bryan	Chafin	Debs	Hisgen	Watson	Gilhaus	Turney	Republican Pluralities	Democratic Pluralities	*Total Vote.	Roosevelt	Parker	Swallow	Debs	Watson	Corregan	Holcomb	Total Vote.
Alabama	...	11	...	11	26,283	74,374	665	1,399	495	1,568	...	...	...	48,091	104,784	22,474	79,857	612	830	5,040	...	...	108,822
Arkansas	...	9	...	9	56,624	87,015	1,194	5,842	289	1,026	...	...	...	30,391	151,990	46,860	64,434	993	1,816	2,318	...	...	116,421
California	10	...	10	...	214,398	127,492	11,770	28,659	4,278	...	...	...	86,906	...	386,597	205,226	89,404	7,380	29,535	...	...	...	331,871
Colorado	...	5	5	...	123,700	126,644	5,559	7,974	...	...	...	...	...	2,944	263,877	134,687	100,105	3,438	4,304	824	335	...	243,693
Connecticut	7	...	7	...	112,815	68,255	2,380	5,113	650	...	...	...	44,560	...	189,903	111,089	72,909	1,506	4,543	494	575	...	191,127
Delaware	3	...	3	...	25,014	22,071	670	239	30	...	...	...	2,943	...	48,024	23,705	19,347	607	146	51	...	...	43,856
Florida	...	5	...	5	10,654	31,104	1,356	3,747	553	1,946	...	...	...	20,450	49,360	8,314	27,046	5	1,605	...	...	...	39,307
Georgia	...	13	...	13	41,603	72,048	1,058	584	77	16,910	...	...	...	30,445	132,280	24,003	83,472	685	197	22,635	...	...	130,992
Idaho	3	...	3	...	50,091	34,609	1,740	6,305	207	...	...	...	15,482	...	92,952	47,789	18,480	1,013	4,949	353	...	...	72,584
Illinois	27	...	27	...	629,932	450,810	29,364	39,711	7,724	633	1,680	400	179,122	...	1,160,254	632,645	327,606	34,770	69,225	6,725	4,698	830	1,076,499
Indiana	15	...	15	...	348,993	338,262	18,045	13,476	514	1,193	643	...	10,731	...	721,126	368,289	274,345	23,496	12,013	2,444	1,598	...	682,185
Iowa	13	...	13	...	275,210	200,771	9,837	8,287	404	251	...	...	74,439	...	494,760	307,907	149,141	11,601	14,847	2,207	...	...	485,703
Kansas	10	...	10	...	197,166	161,209	5,032	12,420	79	...	...	...	35,957	...	375,974	210,893	84,800	7,244	15,494	6,156	...	...	324,588
Kentucky	...	13	...	13	235,711	244,092	5,887	4,060	200	333	404	...	...	8,381	490,687	205,277	217,170	6,609	3,602	2,511	596	...	435,765
Louisiana	...	9	...	9	8,958	63,568	...	2,538	73	...	...	...	...	54,610	75,137	5,205	47,708	...	995	...	...	...	53,905
Maine	6	...	6	...	66,987	35,405	1,487	1,758	700	...	...	...	31,582	...	106,337	64,437	27,630	1,510	2,103	338	...	...	96,027
Maryland	2	6	1	7	116,513	115,908	3,302	2,323	485	...	...	...	605	...	238,531	109,497	109,446	3,034	2,247	...	...	...	224,224
Massachusetts	16	...	16	...	265,966	155,543	4,373	10,778	19,237	...	1,011	...	110,423	...	456,908	257,822	165,746	4,274	13,604	1,294	2,359	...	445,104
Michigan	14	...	14	...	335,580	175,771	16,974	11,586	760	...	1,096	63	159,809	...	541,830	361,866	134,151	13,308	8,941	1,159	8,941	...	520,437
Minnesota	11	...	11	...	195,786	109,433	10,114	14,469	523	...	...	...	86,353	...	330,325	216,651	55,187	6,253	11,692	2,103	974	...	292,860
Mississippi	...	10	...	10	4,463	64,250	...	1,048	...	1,309	...	...	...	59,787	71,070	3,168	53,280	...	392	1,424	...	...	58,264
Missouri	18	...	18	...	347,203	346,574	4,222	15,398	397	1,165	867	...	629	...	715,826	321,449	296,312	7,191	13,009	4,226	1,674	...	643,861
Montana	3	...	3	...	32,333	29,326	827	5,855	443	...	...	...	3,007	...	68,781	34,932	21,773	335	5,676	1,520	208	...	64,444
Nebraska	...	8	8	...	126,608	130,781	5,179	3,524	...	...	...	...	...	4,173	266,092	138,558	51,876	6,323	7,412	20,518	...	...	232,268
Nevada	...	3	3	...	10,214	10,655	...	2,029	415	...	...	...	...	441	23,313	6,867	3,982	...	925	344	...	...	12,118
New Hampshire	4	...	4	...	53,144	33,655	965	1,299	584	...	...	...	19,489	...	89,587	54,164	34,075	750	1,090	83	...	...	90,162
New Jersey	12	...	12	...	265,298	182,522	4,930	10,249	2,916	...	1,196	...	82,776	...	467,111	245,138	164,550	6,838	9,582	3,704	2,676	...	432,488
New York	39	...	39	...	870,070	667,468	22,667	38,451	35,817	...	3,877	...	202,602	...	1,638,350	859,444	683,822	20,776	36,883	7,459	9,125	...	1,617,509
North Carolina	...	12	...	12	114,937	136,995	...	345	...	...	...	...	...	22,058	252,277	82,442	124,121	361	124	819	...	...	207,867
North Dakota	4	...	4	...	57,771	32,909	1,453	2,465	38	...	...	...	24,862	...	94,636	52,595	14,273	1,140	2,017	165	...	...	70,190
Ohio	23	...	23	...	572,312	502,721	11,402	33,795	433	158	720	...	69,591	...	1,121,541	600,095	344,674	19,339	36,260	1,392	2,633	...	1,026,229
Oklahoma	...	7	...	7	110,558	122,406	...	21,779	274	436	...	...	...	11,848	255,453	...	...	...	...	...	...	...	...
Oregon	4	...	4	...	62,350	38,049	2,682	7,430	289	...	...	...	24,301	...	110,800	60,455	17,521	3,806	7,619	753	...	...	90,154
Pennsylvania	34	...	34	...	745,779	448,785	36,694	39,913	1,057	...	1,222	...	296,994	...	1,273,450	840,949	337,998	33,717	21,863	...	2,211	...	1,236,738
Rhode Island	4	...	4	...	43,942	24,706	1,016	1,365	1,005	...	183	...	19,236	...	72,217	41,605	24,839	768	956	...	488	...	68,656
South Carolina	...	9	...	9	3,847	62,289	...	101	43	...	...	...	...	58,442	66,280	2,554	52,563	...	22	1	...	...	55,140
South Dakota	4	...	4	...	67,466	40,226	4,039	2,846	88	...	...	...	27,240	...	114,665	72,083	21,969	2,965	3,138	1,240	...	...	101,395
Tennessee	...	12	...	12	118,287	135,630	360	1,878	332	1,081	...	...	...	17,343	257,568	105,369	131,653	1,889	1,354	2,491	...	...	242,756
Texas	...	18	...	18	65,666	217,302	1,634	7,870	115	994	176	...	...	151,636	293,757	50,307	167,200	3,865	2,787	8,062	421	...	232,642
Utah	3	...	3	...	61,028	42,601	...	4,895	87	...	...	...	18,427	...	108,611	62,444	33,413	...	5,767	...	...	...	101,624
Vermont	4	...	4	...	39,552	11,496	799	802	804	...	...	...	28,056	...	53,453	40,459	9,777	792	859	...	...	...	51,888
Virginia	...	12	...	12	52,573	82,946	1,111	255	51	105	25	...	...	30,373	137,066	46,450	80,638	1,382	56	359	218	...	129,103
Washington	5	...	5	...	106,062	58,383	478	14,177	248	...	...	...	47,679	...	179,348	101,540	28,098	3,229	10,023	669	1,377	...	145,151
West Virginia	7	...	7	...	137,869	111,418	5,107	3,676	46	...	...	...	26,451	...	258,116	132,608	100,850	4,413	1,572	99	...	...	239,542
Wisconsin	13	...	13	...	247,747	166,632	11,572	28,170	...	...	314	...	81,115	...	454,435	279,870	124,036	9,770	28,220	530	223	...	442,649
Wyoming	3	...	3	...	20,846	14,918	64	1,715	61	...	...	...	5,928	...	37,604	20,489	8,930	217	1,077	...	...	...	30,715
Total	321	162	336	140	7,675,909	6,410,027	247,948	432,598	82,821	29,108	13,414	463	1,817,295	551,413	14,893,046	7,620,670	5,080,207	258,205	401,380	112,510	41,330	830	13,539,523
Plurality	159	...	196	...	1,265,882	...	...	...	...	...	...	...	...	...	...	2,540,463	...	...	...	...	...	...	...
Majority	...	...	...	...	459,530	...	...	...	...	...	...	...	...	...	...	1,726,208	...	...	...	...	...	...	...
Percent. of total vote	...	...	...	...	51.54	43.04	...	...	...	...	...	...	...	...	...	56.28	37.52	...	...	...	...	...	...

* Includes scattering votes in a few cases [2].

Election of 1908

Our page of tabulated matter gives you the electoral and popular vote by states for each presidential candidate and enables you to make the comparison of the vote at the last election with that of four years ago. One can readily see the change in votes by states and for the various parties.

The total popular vote increased in four years 1,353,523. The only addition to the electoral vote was the seven gained by the admission of Oklahoma as a state. While Pennsylvania, New York and Illinois lead in the size of their Republican pluralities, it is also interesting to note that these states and Ohio give to the Democratic candidate his greatest popular vote.

This table will not only prove valuable for reference but will also acquaint one with the results of our important function of citizenship.

REPUBLICAN CANDIDATES.

WILLIAM HOWARD TAFT.

BIRTH: Sept. 15, 1857, Cincinnati.
PARENTS: Alphonso and Louise M. Taft.
EDUCATION:
1878 Graduated from Yale.
1880 LL. B. Cincinnati Col. of Law.
1902 LL. D. University of Pa.
1903 LL. D. Yale.
1905 LL. D. Harvard.
1905 LL. D. Miami.
MARRIAGE: 1886, Miss Helen Herron.
FAMILY: Two sons and one daughter.
PROFESSION: Law.
CAREER:
1880 Admitted to Bar.
1882-3 Collector Internal Revenue.
1887-90 Judge of Superior Court.
1890-2 Solicitor General of U. S.
1892 U. S. Circuit Judge.
1901-4 Governor-General Philippines.
1904-8 Secretary of War.
1908 Elected President of the U. S.
HOME: Cincinnati, Ohio.

JAMES S. SHERMAN.

BIRTH: Oct. 24, 1855, at Utica, N. Y.
PARENTS: Gen. Richard and Mary F. Sherman.
EDUCATION:
1878 Graduated from Hamilton College.
1903 LL. D. Hamilton College.
MARRIAGE: 1881, Miss Carrie Babcock.
FAMILY: Three sons.
PROFESSION: Law.
CAREER:
1880 Admitted to Bar.
1884 Mayor of Utica.
1887 Member of Congress.
1908 Elected Vice-President of U. S.
HOME: Utica, N. Y.

DEMOCRATIC CANDIDATES.

WILLIAM J. BRYAN.

BIRTH: Salem, Ill., March 19, 1860.
PARENTS: Silas L. and Mariah E. Bryan.
EDUCATION:
1881 Graduate of Illinois College.
1883 LL. B. Union College of Law.
1884 A. M. Illinois College.
MARRIAGE: 1884, Mary E. Baird.
FAMILY: Two daughters and one son.
PROFESSION: Law.
CAREER:
1883 Admitted to Bar.
1883-7 Practiced Law at Jacksonville.
1887 Removed to Lincoln, Neb.
1891-5 Member of Congress.
1896, 1900, 1908 Presidential Nominee.
1906 Tour of the world with family.
WRITINGS:
1897 The First Battle.
1901 Began publication of Commoner.
1904 Under Other Flags.
HOME: Lincoln, Neb.

JOHN WORTH KERN.

BIRTH: Dec. 20, 1849, Howard Co., Ind.
PARENTS: Jacob H. and Nancy L. Kern.
EDUCATION: 1869, Graduate of University of Michigan.
PROFESSION: Law.
MARRIAGE: 1870, Miss Anne Hazzard.
1895, Araminta Cooper.
FAMILY: Two sons and one daughter.
CAREER:
1872 City Attorney of Kokomo.
1892-6 Indiana State Senator.
1897-01 City Attorney of Indianapolis.
1900-04 Candidate for Governor of Indiana.
1908 Vice-Presidential Nominee.
HOME: Indianapolis.

PROHIBITION CANDIDATES.

E. W. CHAFIN.

BIRTH: 1852, East Troy, Wis.
PARENTS: Samuel and Betsy Chafin.
EDUCATION: Graduate Law Department, University of Wisconsin.
PROFESSION: Lawyer.
MARRIAGE: Carrie A. Hankins.
CAREER:

1876-1900	Lawyer at Waukesha, Wis.
1882-1902	Candidate for Congress.
1886-1900	Candidate for Attorney-General.
1898	Candidate for Governor of Wisconsin.
1908	Presidential Nominee.

WRITINGS:

1876	Voters' Handbook.
1896	Lives of the Presidents.

HOME: Chicago.

A. S. WATKINS.

BIRTH: 1863, Logan County, Ohio.
PARENTS: Quakers.
EDUCATION: Ohio Northern University.
Taylor University.
PROFESSION: Minister, Lawyer, Teacher.
CAREER:

1905	Candidate for Governor of Ohio. Professor Literature Ohio Northern University.
1908	Vice-Presidential Candidate.

HOME: Ada, Ohio.

SOCIALIST CANDIDATES.

EUGENE V. DEBS.

BIRTH: 1855, Terre Haute, Ind.
PARENTS: Daniel and Marguerite Debs.
EDUCATION: Secured in Common Schools.
PROFESSION: Workingman, Writer, Lecturer and Orator.
MARRIAGE: Katherine Metzel.
CAREER:

1871-4	Locomotive Fireman.
1879-83	City Clerk of Terre Haute.
1885	Member of Indiana Legislature.
1886-93	Grand Secretary and Treasurer Brotherhood of Locomotive Firemen.
1893-97	President American Railway Union.
1900, 4, 8	Presidential Nominee, Socialist Party.

HOME: Terre Haute, Ind.

BENJAMIN HANFORD.

HOME: New York.
Member of Typographical Union twenty-eight years.
Socialist Orator.

POPULIST CANDIDATES.

THOMAS E. WATSON.

BIRTH: 1856, Columbia County, Ga.
PARENTS: John and Ann Watson.
EDUCATION: Two years in Mercer College.
PROFESSION: Lawyer, Author, Editor.
CAREER:

1875	Admitted to Bar.
1882-3	Member of Georgia Legislature.
1891-3	Member of Congress.
1896	Populist Vice-Presidential Nominee.
1904-8	Nominee for President.

WRITINGS:

1898	Story of France.
1900	Life of Thomas Jefferson.
1902	Life of Napoleon.

HOME: Thomso Ga.

SAMUEL WILLIAMS.

BIRTH: 1846.
PROFESSION: Law.
CAREER: Member of Legislature of Indiana.

INDEPENDENCE CANDIDATES.

THOMAS L. HISGEN.

BIRTH: 1858, Petersburg, Ind.
EDUCATION: Secured in Common Schools.
PROFESSION: Business Man.

JOHN TEMPLE GRAVES.

BIRTH: 1856, Willington Church, S. C.
PARENTS: Joseph P. and Katherine Graves.
EDUCATION: Graduate University of Georgia.

CAREER:
Clerk in Country Store.
Oil Merchant at Albany, N. Y.
1907 Independence Candidate for Governor of Massachusetts.
HOME: Springfield, Mass.

PROFESSION: Journalist and Orator.
MARRIAGE: Mattie E. Simpson.
CAREER:
1881-90 Editor.
1905-07 Editor Atlanta Daily Georgian.
1907 Editor New York American.
HOME: New York City.

Platforms

REPUBLICAN PLATFORM.

1. Tariff revision on basis of protection.
2. Investigation of currency question by commission and development of adequate currency system.
3. Establishment of postal savings banks.
4. Strengthening of Sherman Anti-Trust Law by amendment for curbing of trusts.
5. Strict enforcement of laws prohibiting rebating and railroad rate discrimination.
6. Employers' liability law; further legislation to improve conditions of laboring men.
7. Integrity of courts; modification of rules governing issuing of injunctions.
8. Extension of rural free delivery.
9. Enforcement of 13th, 14th and 15th amendments for the protection of the negro.
10. Conservation of natural resources.
11. Maintaining efficiency in army and navy.
12. Liberal pensions to veterans.

DEMOCRATIC PLATFORM.

1. Curtailment in national expenditures.
2. Revision of rules of House of Representatives, limiting power of speaker.
3. Immediate and thorough revision of tariff to stop special privileges and give equality of opportunity to all.
4. Immediate admission of Arizona and New Mexico as states.
5. Modification of law governing injunctions.
6. Alaska and Porto Rico to be made territories.
7. Enlargement of powers of interstate commerce commission.
8. Strict enforcement of railroad rate and anti-trust laws.
9. Maintenance of an adequate army and navy.
10. Election of U. S. Senators by direct vote.
11. Publication of campaign contributions before elections.
12. Income tax and guarantee of bank deposits.

PROHIBITION PLATFORM.

1. Prohibition of manufacture and sale of liquor by constitutional amendment. Immediate prohibition of liquor traffic for beverage purposes in the District of Columbia, the territories and all places over which the national government has jurisdiction.
2. Election of U. S. senators by direct vote.
3. Postal savings banks and guarantee of bank deposits.
4. Uniform marriage and divorce laws; employers' liability law.
5. Prohibition of child labor in factories, etc.
6. Basing of suffrage only on intelligence and the ability to read and write the English language.

SOCIALIST PLATFORM.

1. Collective ownership of all land and of all means of transportation and communication.
2. Abolition of the United States Senate.
3. Election of all judges for short terms.
4. Inheritance and income tax.
5. Initiative, referendum and right of recall.
6. Universal suffrage.

POPULIST PLATFORM.

1. Power to issue money to belong to the government alone.
2. Government ownership of railroads and public utilities.
3. Initiative and referendum.
4. Abolition of child and convict labor.
5. Giving workmen work on public buildings in times of depression.

INDEPENDENCE PARTY PLATFORM.

1. Restoration of government to principles of Washington and Jefferson.
2. Direct nominations; initiative and referendum; right of recall.
3. Opposition to arbitrary use of injunctions; trial by jury in all contempt cases.
4. Rigid employers' liability and child labor laws. Extension of eight-hour work day to all government work.
5. Gradual reduction of the tariff; establishment of postal savings banks.
6. Criminal punishment for violators of anti-trust laws; extension of principle of public ownership to all utilities.

The best work a student does is that which teaches him the love of work and study.
—*Bishop Spalding.*

Common Subjects

We feel that our EDUCATOR would not be complete unless mention was made of what, from lack of a more suggestive name, we term "COMMON SUBJECTS." The work along this line in THE NEW PRACTICAL REFERENCE LIBRARY is indeed complete and interesting. From the primary up through the different grades the teacher and student are face to face with a thousand and one articles both at home and in school the elements and preparation of which he is in all but absolute ignorance; especially is this true of the processes of manufacture, sources of material, etc.

Take, for instance, the new and oftentimes startling uses to which the by-products of an industry are put: the making of buttons from blood, the conversion of rags, straw, etc., into paper, the manufacture of glass, celluloid, combs, needles, pins, etc.; the utilizing of the bones, hair, hoofs, etc., of animals into everyday articles, the use of which is perfectly familiar to the student, though of the source or methods of manufacture he has not the remotest idea. It gives us a sense of satisfaction to know that the teacher, student or general reader whenever occasion arises may consult THE NEW PRACTICAL REFERENCE LIBRARY on the subject in mind and invariably find a complete and interesting treatment of same.

We cite you to our outlines below in which a number of these subjects are treated, indicating the manner of handling others.

Meat Packing

U. S. GOVERNMENT INSPECTION.
- Requirements.
- How enforced.
- When effective.
- Results.

REFRIGERATION.
- Railroads.
- Steamships.

CENTERS.
- Name four.
  1.
  2.
  3.
  4.

BY-PRODUCTS.
- Horns.
- Hoofs.
- Combs.
- Buttons.
- Knife handles.
- Glue.
- Soap.
- Oils.
- Hair.
- Wool.
- Bristles.
- Hides.
- Blood, etc.

PROCESSES.
- Transporting stock.
- Unloading.
- Killing.
- Dressing.
- Cooling.

PRODUCTS.
- Fresh meats.
- Salt meats.
- Smoked meats.
- Lard.
- Tallow.
- Canned beef.
- Sausage, etc.

QUESTIONS.

How many hogs are slaughtered every minute in the Chicago packing houses?

Are cattle given any rest after reaching the stockyards before being slaughtered?

How long does it take to cool pork in the cooling room? Beeves? What is the temperature?

What is done to make the meat more tender?

What are the leading packing centers of the country?

Of what does the late government meat inspection consist?

What is an abattoir?

How many minutes does it require to kill and dress a hog? A steer?

How is fresh meat shipped from Chicago or other packing centers to European cities?

What is the value of hogs' bristles exported each year?

How many million cattle are slaughtered in the United States every year? How many sheep? Hogs?

Paper

HISTORY.
- Origin.
- First Use.
  - a. China.
  - b. Continent of Europe.
  - c. England.
  - d. United States.

MANUFACTURE.
1. Materials:
   - Linen rags.
   - Cotton rags.
   - Wood pulp.
   - Wood fiber.
   - Wheat straw.
   - Corn husks.
   - Hemp.
   - Esparto.
   - Jute.
   - Silk (in small quantities.)
2. Processes:
   - Grinding.
   - Bleaching.
   - Coloring.
   - Changing pulp to paper.
   - Calendering.

VARIETIES.
- Woven.
- Laid.
- Bond.
- Linen.
- Manila.
- Japanese.
- Indian.

USES.
- Name five.

QUESTIONS.

From what does paper take its name? Why?

To whom is credit given for the discovery of paper-making?

How many centuries before Christ was the art known?

Name three of the most important and valuable uses to which paper is put. Why your answer?

When and where was the first paper mill in the United States started? How does the United States now rank in its manufacture?

From what is the paper of the newspapers made? The paper of your writing tablet?

Describe in detail how rags are made into paper. What does the pulp resemble?

Describe the various sections and functions of a modern paper-making machine.

How is the water-mark made?

What is the best quality of paper? For what is it largely used? What paper is hand-made?

Glass

I. Kinds.
- Plate.
- Flint.
- Crown.
- Cut.
- Colored.
  - See color plate.
- Stained.

II. History.
- Egypt.
- Greece.
- Venice.
- Bohemia.
- England.
- United States.

III. Manufacture and ingredients.
- Fuel.
- Furnace.
  - Shape.
  - Capacity
  - Pots.
- Sand.
- Soda.
- Lime.
- Potash.

IV. Shaping.
- Blowing.
  - Bottles.
  - Vases.
  - Window glass.
- Pressing.
  - Tableware.
- Casting.
  - Plate glass.

V. Color Plate.

QUESTIONS.

What is glass? When was the discovery made?

In what country were specimens of glass discovered made as early as 2000 B. C.?

Did the ancient Greeks know the art of artistic glass-making?

How is window glass made? How cut? How flattened?

How are bottles made? Glass fruit jars?

How is cut glass made? What makes it so expensive?

How is stained glass made?

When and where was glass first used for windows?

What fuel is used in the furnace in making glass?

Why should the raw materials be pure?

How is coloring in glass introduced?

When was the manufacture of glass first introduced in the United States?

What are the leading countries in the manufacture of glass?

What tools does a glass-blower use?

To what is due the softness and brilliancy of plate glass?

Why are glass factories most numerous in the gas belts of the country?

How many pounds of melted glass does the blower gather at the end of his pipe? How does he make it long?

How is lettering placed on bottles?

Camphor

I. Description.
1. What is camphor?
2. What tree produces it?
3. Product of what countries?
4. Prepared chiefly in what island?
5. What is the height of the Borneo camphor tree?
6. What other plants yield it?

II. Uses.
1. As a stimulant.
   a. Internal.
   b. External
2. As a poison.
3. As a preservative.

Banana

I. Stem.
   1. What is the height of the plant?
   2. How is the stem formed?

II. Leaves.
   1. How many feet long are the leaves? How many wide? Used for what?
   2. Ribs.
   3. Veins.

III. Flowers.
   1. How long do the spikes of the flowers grow?
   2. Do the flowers blossom with their faces toward the ground or upward?

IV. Fruit.
   1. Which way does the fruit turn?
   2. How many pounds does a bunch of bananas weigh?
   3. What countries ship enormous quantities of the fruit to the United States?
   4. How is a bunch of bananas hung in the fruit store?

Brick

I. Manufacture.
   1. Material used.
   2. Process of making.
   3. Brick-making of early times.

II. Varieties.
   1. Pressed brick.
   2. Fire brick.
   3. Pavement brick or vitrified brick.
   4. Hollow tiles.

III. Size of Brick.
   1. Length.
   2. Width.
   3. Thickness.

IV. Uses of Brick.
   1. Buildings.
   2. Foundations.
   3. Sewers.
   4. Cisterns.
   5. Pavements, etc.

Correlated Subjects: Brick-Laying; Clay; Tile.

QUESTIONS.

How many kinds of brick are found in your neighborhood? Name them.
Of what is brick made? In what way are bricks dried?
In what ancient countries have sun-dried bricks been found?
Why are some of these bricks of great historic value?
By whom was the art of brick-making introduced into England?
What kind of clay should be selected for the making of brick? What proportion of sand should it contain? Why is this necessary? How are bricks cut?
Why are some bricks re-pressed?
How many bricks will a good machine make in a day?
Describe a brick-kiln. What is meant by "firing?" How many days does this require?
Where are brickyards found?
Where are the greatest centers of the brick industry in the United States?
How many bricks does our country produce a year?
What is the value of this product?
Which variety of brick outnumbers all other styles?
What is pressed brick? Why is fire brick so called?

Dress

The style and manner of dress of the different races can be seen by referring to the color plates *American Indians*, *Mongolian Types* and *Negro Types*, in connection with their respective articles in THE NEW PRACTICAL REFERENCE LIBRARY.

I. DEFINITION.
   1. General meaning.
   2. Special meaning.

II. ANCIENT.
   1. Egypt.
      a. Style.
      b. Articles.
      c. Materials.
   2. Assyria.
      a. Style.
      b. Materials.
      c. Trimmings.
   3. Greeks.
      a. Style.
      b. Articles.
         Chiton.
         Peplos.

III. EASTERN NATIONS.
   1. Chinese.
      a. Any change from ancient?
      b. Dress accords with what?
      c. Laborers dress how?
      d. People of rank dress how?
      e. Garments. Men? Women?
   2. Japan.
      a. Style.
      b. Garments worn.
      c. European dress.
   3. India.
      a. Style.
      b. Materials.

IV. EUROPEAN NATIONS.
   1. Middle Ages.
      a. Men.
         Cloaks.
         Other articles.
         Armor. Why?
      b. Women.
         Articles.
         Style.
   2. Close of Middle Ages.
      a. What radical changes in style?
      b. Men.
         Garments cut how? How many? What materials?
      c. Women.
         Garments, styles, etc.
   3. Sixteenth to Eighteenth Centuries.
      a. Excessive extravagance.
         Leaders of fashion.
         How extravagant?
   4. Nineteenth to Twentieth Century.
      a. Modern fashions.
         Follow style of what age?
         What articles worn?
         Fashions governed by whom?
         How vary from year to year?

V. BARBAROUS NATIONS.
   1. American Indian.
   2. Eskimo.
   3. Negro tribes of Africa.

QUESTIONS.

Judging from colored plates, what would be your objection to the apparel there shown? In what ways does it recommend itself?

In what ways is the modern dress of men superior to the ancient?

Were the men of ancient times handicapped by such apparel? Give reason for your answer.

Did the garment in ancient days depend in any way upon the work performed? Does it in modern times?

What is the costume known as the Louis XIV style? Did men and women in the United States ever follow this style? If so, when and where?

What is the dress of the American Indian? Eskimo? Highland Scot?

Tell what the following are and when worn and by what sex, what nation: Chiton, himation, peplos, toga, tunic, doublet, etc.

What quality of materials is worn by Chinese and Japanese of rank?

Who were the first people to fit the clothing?

What nations can be said to have worn classic styles?

What changes in the dress of men and women have occurred in the last fifteen years? Can you see any relation between these changes and the modern ideas in sanitation, comfort and utility? Has the modern tendency toward simplicity in furniture and interior decoration a parallel in dress? Has woman's invasion of the industrial field affected her dress? If so, in what respect?

Athletics has a tendency to create what styles in dress?

What is known as the colonial style of dress?

The styles of United States as a general rule follow those of what country? The styles of Canada?

What are the principal cities of fashion in United States? In Europe? What nation of Europe leads in styles of dress?

Cloths and Clothing

I. Materials—Raw.
   1. Silk. 3. Cotton. 5. Flax. 7. Hides. 9. Feathers.
   2. Wool. 4. Fur. 6. Hemp. 8. Rubber. 10. Bone, Pearl, etc.

II. Preparation.
   1. Raw Articles.
      a. Where and how obtained.
      b. Rough processes for local markets.
   2. Manufacture.
      a. Methods—spinning, weaving, dyeing, tanning, etc.
      b. Placing product on world's markets.

III. Factories.
   1. Location.
   2. Product.
      a. Cloths—All colors, weaves, qualities, quantities of silk, woolen, linen, cotton, etc.
      b. Clothing—Ready-made wearing apparel of fur, leather, cotton, silk and woolen goods, feathers, rubber, linen, bone, pearl, etc.

IV. Markets.
   1. Wholesale.
   2. Retail.

QUESTIONS.

Possibly that red button on your coat was made of blood; tell about it.

How can you tell linen towels from cotton ones?

What can you find in your home made of hemp? Flax? Hides?

Compare your fine new shoes with those worn a hundred years ago.

What do we mean by worsted goods? "All wool?" What is mixed goods?

Of what materials can lace be made?

What is celluloid? What have you in your home made of it?

Give different articles of clothing made of leather.

Which would you rather have, a silk or a calico dress? Why?

What do you think governs the price of cloth?

Why did a cotton famine occur in England during the Civil War?

How does ready-made clothing compare with that of twenty-five years ago in completeness?

Give a complete list of cloths used for wearing apparel in dress goods, underwear, etc. See how long you can make the list. Give the same of ready-made clothing.

What are velvet, plush, beaver, satin, etc.?

What determines the fineness of a piece of cloth?

Locate cotton and woolen mills throughout the world.

Can you trace the sap of the rubber tree until it comes to you in the shape of a pair of rubbers?

What do we mean when we say warp, filling, selvage, etc.?

You notice a beautiful plume in a milliner's window. Where did it come from?

Correlated Subjects: See different raw materials mentioned.

QUESTIONS.—Leather.

How are the skins of animals made into leather?

What is made from the skins of large animals such as the horse, ox, etc.?

How is tanning accomplished? How is the softening hastened? How is the hair removed?

What is done to prevent the formation of hard and brittle leather?

How long does it take to accomplish the tanning of large hides?

What skins are prepared by tanning?

From what is sole leather made? How is morocco leather made? Patent leather?

What country manufactures the best leather in the world?

The bark of what well-known tree is used in tanning?

Sugar

I. Sources.
  1. Sugar Cane.
    a. Where grown?
      Foreign.
      United States.
    b. Description.
      Height.
      Leaves.
      Resembles what plant?
    c. Sugar mills.
      Processes.
      Crushing stalks.
      Reduction of sap.
      Refining, etc.
    d. Products.
      Granulated sugar.
      Loaf sugar.
      Brown or raw sugar.
  2. Beets.
    a. Where grown?
      Foreign.
      United States.
    b. Sugar factories.
      Processes.
      Slicing beets.
      Drawing juice.
      Refining, etc.
  3. Maple Sap.
    a. Where produced?
    b. Season.
    c. Securing sap.
    d. Sugar-making (see sugar cane).
    e. Flavor, value, etc.
  4. Sorghum.
    a. Resembles what plant?
    b. Process (see sugar cane).
    c. Product.
      Syrup.
      Sugar—not of commercial importance.

II. Sugar Refineries.
  1. Location of.
  2. Work of refining.
  3. Annual output cane sugar, beet sugar.
  4. United States.
    a. Annual output of cane sugar.
    b. Annual output of beet sugar.
    c. Annual consumption of sugar.
    d. Annual importation of sugar.
    e. Annual consumption of individual.

III. By-Products.
  1. Molasses and Syrups.
    a. Sorghum.

b. New Orleans molasses.
c. Foundation for all syrups.
2. Bagasse. How used?
3. Beet Chips. How used?

IV. Uses.
1. Food.
2. Medicine.

V. Comparison.
1. One ton cane produces?
2. One ton beets produces?
3. Four gallons maple sap produce?

QUESTIONS.—Sugar.

How many pounds of sugar are made from a ton of beets? From a ton of West India cane? Louisiana cane?

How many pounds of sugar are used to each individual yearly in the United States?

What is the sugar you use daily made from—beets, sugar cane or maple sap?

How is loaf sugar made?

In what cities are some of the sugar refineries located in the United States? How many beet sugar factories are there? With what product do they work? What stage of the work do they handle?

How many thousands of tons of beet sugar are produced yearly in the United States?

What are the chief uses of maple sugar? What states in the Union lead in its production?

What is sorghum? Why is not the cane suitable for sugar?

What do we mean by raw sugar? What is "C" sugar? Brown sugar?

How is sugar regarded as a food? What is the effect upon the body?

What islands lead in the raising of sugar cane?

What states in the Union lead in the production of sugar?

What foreign countries lead in this enterprise?

How does the cane in the tropics compare with that of cooler climates?

What becomes of the crushed stalks?

Upon what does the growth of the sugar cane depend largely?

For how long a period does one planting last? Is this an important factor?

Why is maple sugar so highly prized?

What is done with the beets after extraction of the sugar? With the cane stalks?

What color is the raw sugar? What is used to whiten it?

Tell some of the domestic uses of sugar. What is candy made from?

What vegetables contain sugar? What grains? What liquids?

Think carefully of the different kinds of food and ascertain how many of them contain sugar in some form.

Salt

Sources.

Rock, Salt Water, Brine Springs.

What is the great difference between salt and sugar other than in taste? In how many respects are they alike?

Note.—The great Austrian salt mine at Wieliczka has 600 miles of galleries and employs 9,000 miners. It has been worked for the past six centuries.

Where is salt extracted from sea water, principally produced?

By what process of drying is the purest variety produced?

What is salt made from sea water generally called?

From what source is the most salt produced?

Where in the United States would you find rock salt? Salt made from springs or wells?

In what inland state is found a lake whose waters yield fourteen pints of salt to every five gallons evaporated?

USES.

For seasoning.

For preserving.

For glazing pottery.

For hardening soaps, clearing glass, etc.

For what has salt been used since the earliest times?

What is it used for in manufacturing?

Of what chemicals is it the chief source?

SOURCES OF SUPPLY.

Foreign Countries.

United States.

a. Michigan. c. Utah. e. New York. g. Pennsylvania.
b. Kansas. d. Louisiana. f. Ohio. h. Illinois.

Where were salt mines worked extensively in the twelfth century and for what are they famous?

What is the leading salt-producing state in the Union?

What was the total production in the United States in 1902?

To what remarkable depth have the mines near Saginaw Bay, Michigan, been sunk?

Where is there an island of 144 acres of pure salt? How many tons is it estimated to contain?

With salt selling at two cents per pound what would be the value per acre of this island?

On what river's bank in Nevada is there a bluff of salt twenty-five miles long?

MISCELLANEOUS QUESTIONS.

Under the letter "A" in THE NEW PRACTICAL REFERENCE LIBRARY we have selected at random a few questions given below to which answers will be found by looking up subjects capitalized as *Aladdin*, *Alamo*, etc. Thousands upon thousands of similar questions will be found interestingly and satisfactorily answered throughout the LIBRARY and will furnish an endless chain of profitable study.

Who was the founder of the *Abolitionist* party? Who were some of its prominent leaders?

When did *Abruzzi* make his famous trip to the Polar regions and what high latitude did he attain?

How is *Acetylene* gas produced? How does it differ from ordinary illuminating gas?

Who was *Achilles?* All but what small part of his body was invulnerable?

What is an *Acrostic* poem? In what style of verse has it been used?

What President of the United States was elected and served in Congress after the presidency?

For what is *Jane Addams* famous?

What is the proper form of *Address* in addressing the President? A governor? An archbishop?

Why is the *Adjutant* bird protected in India by law? Why its name?

What are the common *Adulterations* of food products? How is coffee adulterated? Bread? Milk? Tea? Pepper? Tobacco?

What enormous sum is expended every year for *Advertising* in the United States?

What is the story told in the *Æncid*, the great epic poem? By whom was it written?

Name five of the fables accredited to *Æsop*.

How does the area of *Africa* compare with that of North America? Of Asia? Europe?

How does the population of the British colonies in Africa compare with the population of the British Isles?

Who was *Louis Agassiz* and for what is he noted? For what is his son famous?

Where and when was the first *Agricultural* college established? What allusion was made to such a college by Washington in his first message?

What studies are included in the course of study and what experiments are made?

What is strange and peculiar about the *Aino* people?

How many parts of *Air* is oxygen? Nitrogen?

Describe the *Air* brake. By what means does it work automatically?

Describe the principles of the *Air Pump*. What happens to a lighted candle placed under the receiver as the air is exhausted? To a bell? An apple? What does this prove? Who invented the air pump?

What is the popular name of *Alabama?* In size how does it compare with your state?

What was the enormous loss inflicted on the Federal merchant fleet and how many vessels were captured by the *"Alabama?"*

What was *Aladdin's* lamp? Give a brief description of its many mystic wonders.

Why is the *Alamo* called the "Thermopylæ of America?"

For what remarkable length of time was the Alamo successfully defended and by how many?

How does the length of *Alaska* from north to south compare with the distance from Washington to New Orleans?

What is the size of Alaska? How does that compare with Texas and California combined?

When and from whom was Alaska purchased by the United States and at what price?

Which is the more valuable, the production of gold or the fisheries of Alaska?

Give five reasons why the purchase of Alaska was a bargain to the United States.

What was Alaska's population in 1910? Of these how many were whites? If the territory were cut up into equal parts how many sections would fall to the lot of each man, woman and child?

Which has the larger population, Nome, Alaska, or Trenton, N. J.?

What building in *Albany*, N. Y., cost over $24,000,000? For what is it noted?

What is an *Albino?* What causes the lack of color?

Why is *Alcohol* used in thermometers for recording very low temperatures? What is wood alcohol?

What was *Louisa May Alcott's* most famous book?

For what was *Alexander the Great* famous?

What makes *Alfalfa* especially valuable in times of drought? How many tons are raised per acre?

What qualities of greatness distinguished *Alfred the Great* from the many monarchs to whom the title "Great" has been given?

What is the science of *Algebra?* To what remote period does it date?

How many *Algonquin* Indians remain in Canada and the United States?

What were the *Alien* and *Sedition* laws?

When and where were *Almanacs* first used? For what were they so long popular? What was the most famous American almanac? English?

What are some of *Alma-Tadema's* well-known paintings?

What is the oldest of all *Alphabets?* From what is the English alphabet derived?

What is the general form of the *Alps?* For what are they noted? What are the two highest peaks? How are the glaciers formed?

What two animals are common to the Alpine region? Why?

What is *Aluminum?* When was it discovered? What are its principal qualities and uses?

How does the *Amazon* River compare in size with the Mississippi? What causes the water to raise thirty feet in the mouth of the river at a certain time each month?

What are the duties of an *Ambassador?* When are ambassadors ordinary? Extraordinary? Plenipotentiaries?

What is *Ammonia?* Name some of its uses?

What is the height of some of the peaks of the *Andes?*

The *Angel* fish is very ugly and voracious; then why so named?

What is an *Anesthetic?* What are some of the common forms in which administered?

What are some of the artificial baits used in *Angling* and from what and how made?

How have we come to have a knowledge of *Animal Intelligence?* Is the vision, hearing, memory, smell and taste of animals greatly developed? Give examples of each.

How does nature protect certain kinds of *Antelopes?*

Where is *Antioch* located? When did it have a population larger than that of Cincinnati?

What is an *Antiseptic?* Name several in common use.

How does the brain of the *Ape* compare in size to man's?

What are the symptoms of *Appendicitis?* When is death from this disease almost certain?

What is an *Aqueduct?* What is the size of the Croton aqueduct and where located?

What is the story of the *Arabian Nights?*

Where is *Ararat* Mount? With what biblical event is it associated?

What is *Arbitration?* What is a recent notable example?

When was *Armor Plate* first used on war vessels?

Who was *Benedict Arnold?* How did he die?

Describe the formation of *Artesian* wells.

From what and how are *Artificial* limbs made?

What is *Asbestos?* Where is it obtained? For what is it useful? What workmen wear mittens made from it and why?

What is asphaltum? Where is it obtained? For what is it used? By what other name is it known?

How is *Association Football* played? How does it differ from the Rugby style of playing?

By what means can you ascertain if you are affected with *Astigmatism?*

What animal furnishes the *Astrakan fur?*

What is an *Attachment* in law? An *Attainder?*

The *Audubon Society* is doing what creditable work?

What causes the *Aurora Borealis* or northern lights?

Who is *Alfred Austin?*

What is an *Avalanche?* Where did one fall containing a quarter of a million tons of snow?

Where are the *Azores?* To what country do they belong?

QUESTIONS.—Life-Saving Service.

What is the life-saving system?

When was it established in the United States?

How many life-saving stations in the country?

Of how many persons is a crew made up?

What is the head of the crew called?

When the waves are too high to use a life-saving boat, how are rescues made?

How and by what means are lives saved from vessels out of reach of the lifeboats?

Besides the saving of lives what constitute some of the important duties of the life-saving crew?

What is a buoy? A life-saving gun? A rocket?

CURRENT EVENTS.

Should both the President and Vice President suddenly die or become disabled from holding office, who would succeed to the presidency?

How many lives were lost in the Kingston disaster of 1907?

How many people are employed by the postmaster-general?

What is the average number of people to each postoffice in the country? Why are there fewer postoffices today than in 1900?

Who is the speaker of the House of Representatives?

Who is the present Secretary of State? Of War? Of Agriculture? Who i Chief Justice of the Supreme Court? How many chief justices since Washington's administration?

What two bodies of water will the Panama Canal connect? What will be its length? What is its width? Depth?

What is reciprocity? Why do manufacturers of certain products oppose reciprocity treaties? Cite a recent example.

How is free trade considered by most economists? What advantages would free trade bring you? What disadvantages?

If you sent goods to London or Paris would you be required to pay any custom duties on same to our government? If you purchased goods in either of the two cities or any other foreign city, would you be required to pay duty on them, and to whom?

What relation are Emperor William and King George V?

Where is the Williamsburg Bridge? What is its length? How does it compare with the Brooklyn Bridge?

What industry would you find along the Columbia River?

Who is at the government head of the Philippine Islands? Is he elected or appointed, and by whom?

Of what are the native houses of the Philippine Islands made? (Observe the illustration.)

What is the Duma? How does it correspond to our lower house of congress?

When did Oklahoma become a state? What is its popular name?

Who is the present king of Spain? How old is he?

What two points will the Cape-to-Cairo Railway connect, and what will be its length?

From your location what would be the shortest and quickest route to Manila? Would this have been so before the completion of the Suez Canal?

Were you to visit Newfoundland what would you find the people chiefly interested in? The people of Cuba? Of Alaska? Of Hawaii?

What are some of Bryan's principles of government reform?

What would be the several modes of transportation you could avail yourself of in going from place to place in New York city? In London? In Venice?

What are the different motive powers in automobiles? Which so far has proved the most satisfactory? Why?

Were you to seek a clerkship in any of the government departments, in what subjects would you have to pass an examination? What per cent of proficiency would you have to show to become eligible to appointment?

Who is Nicola Tesla, and for what is he world-famous?

What is the Associated Press? How many newspapers are printed and folded per hour by some of the large printing presses?

How many newspapers are there in the United States?

How many Philadelphias would London make?

What are the two great types of mechanisms invented for aerial navigation?

Give the list of great persons whose centenaries occurred in 1909.

When was the Shanghai and Nanking Railway completed?

What are the general principles of the Marconi system of wireless telegraphy?

Who is the present Governor-General of Canada? How are the nine provinces of Canada governed?

By whom and when was the North Pole discovered?

Where was the fourth celebration of the Olympic Games held? What nations were represented by the contestants in these games?

What are the general characteristics of the great national awakening of China?

When and by whom was radium discovered? What are the general properties of the Roentgen rays?

What was the declaration presented at the Second International Peace conference relating to the use in warfare of devices for aerial navigation?

What changes occurred in the government of Turkey in 1909?

What is the Union of South Africa? When was it formed?

What calamity befell Paris in 1910?

What caused the great controversy over the British budget in 1909? What was the result of the election which followed in January, 1910?

Drawing

INTRODUCTION.

Drawing is a mode of expression. It is as natural to the child as writing and is used by him long before he learns to write, and in many instances even before he learns to talk. Experienced teachers of drawing claim that were drawing taught with as much care and persistence as language in the primary grades of the public schools, the children would go from these grades as proficient in one mode of expression as in the other.

The practical value of ability to draw even simple objects is almost beyond estimate, let one's occupation be what it may; while to those engaged in the occupations of carpenter, blacksmith, dressmaker, and other common occupations requiring mechanical skill, a knowledge of drawing is indispensable. Notwithstanding this, how few can draw even the simplest designs. The common expression, "I can't draw a straight line," is in most cases more real than imaginary.

Whoever goes into life without knowing how to draw is handicapped in his ability to express himself. Ability to draw also enables one to make plain many things which cannot be explained by words alone, as the description of a machine or the plan of a house. Moreover, a knowledge of drawing gives one a knowledge of form and size which enables him to judge machines, tools, houses and other structures more accurately than is possible without such knowledge; it gives him an insight into the beauties of form and structure in the various objects of nature—as rocks, flowers, insects, birds and animals, and this contributes much to his enjoyment of the works of creation. From any point of view, the man or woman who can draw has great advantage over one who cannot.

Considering the importance of drawing, we often wonder why so few people are able to draw even the simplest objects, and when we compare the results derived from teaching drawing in the public schools with results from teaching other branches, we find the comparison anything but encouraging. Doubtless the chief reason for the failure to secure good results in drawing lies in the fact that drawing has not been, and in general is not yet taught as systematically as are the other branches in the course of study. This does not mean that regular lessons in drawing have not been given, but it does mean that underlying principles have not been presented and drilled upon as they are in the teaching of arithmetic, language and other common branches. Where this is done the children learn to draw as readily as they learn writing, language or other subjects. It is the purpose of the exercises on the following pages to illustrate how drawing can be taught systematically and how anyone who so desires can learn to draw.

The exercises here given were prepared by Prof. D. R. Augsburg, author of *Augsburg's Drawing*. After many years of experience as a teacher and supervisor of drawing, Prof. Augsburg has solved the difficult problem of presenting

this subject systematically and upon a scientific basis. The success of his work is such that within the few years since the publication of his books they have found their way into the public schools throughout the United States and also in some foreign countries. Wherever used they have been productive of excellent results. In these exercises Prof. Augsburg gives the principles underlying his system of drawing, and shows the method of their application. The exercises are plain, simple and arranged in logical order. The directions are so complete that anyone can follow them, and any person who will practice these exercises as directed will learn to draw and thereby add to his other powers of expression that of pencil and brush.

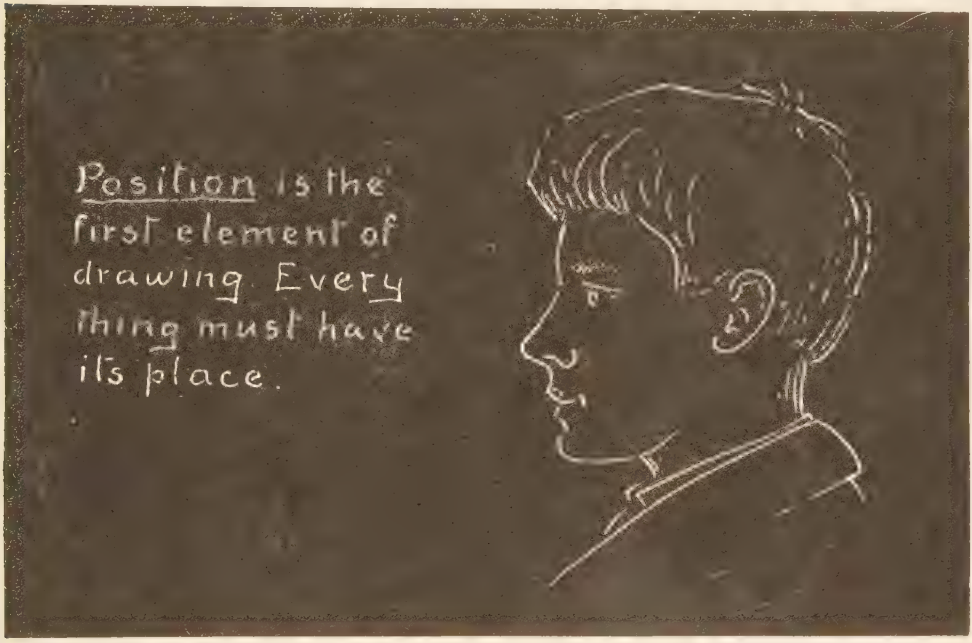


Fig. 1.

FREE-HAND DRAWING.

The three great mechanical mediums through which we formally acquire and express thought are:

Language, the medium of communication,

Number, the medium of measurement,

Drawing, the medium of form and color.

These three mediums, or studies, are fundamental in character and largely mechanical in construction. The elements are taught and learned more or less mechanically, and are the basis of all other branches.

The esthetic element is common to all of these mediums, in language as poetry, in number as rythm and in drawing as the artistic. Music is the esthetic element of sound.

The mechanical elements of the above studies can be taught by all teachers and learned by practically all pupils, and during the process of teaching and learning, the esthetic elements are more or less absorbed.

The fundamental elements of free-hand drawing are:

Position, or the placing of objects.

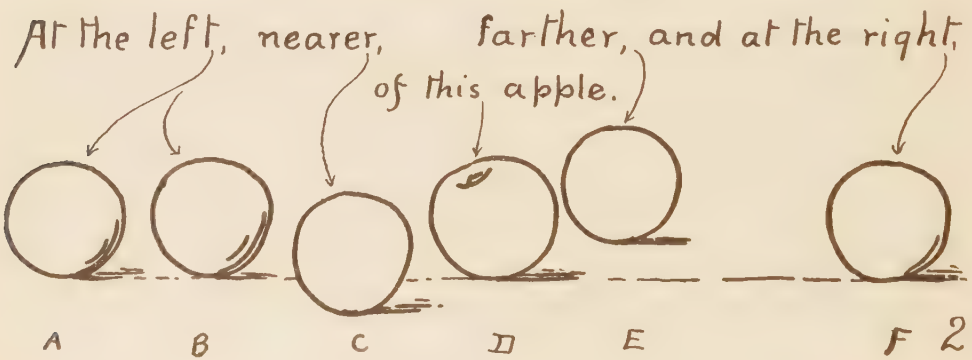
Direction, or the surface of objects,
Form, or the shape of objects, and
Proportion, or the size of objects.

These elements are mechanical and can be taught by all teachers and learned by practically all pupils. They are to drawing somewhat as addition, subtraction, multiplication and division are to numbers. Through them the fundamental processes of drawing are taught and learned.

To these may be added the esthetic element, which in drawing is called the artistic or character element. This element is gained largely through absorption. The artistic cannot be taught in the direct manner of the mechanical elements, but is gained more slowly as the principle and the mechanical processes are learned. As the fundamental elements or processes are taught, the esthetic element is absorbed to a greater or less degree, according to the temperament of the pupils.

Position.

Position tells how to place objects in the picture or drawing. From the first, position deals with one object or a part of an object in relation to other objects. If two apples or three balls are drawn, each must have its place; and in advancing to higher levels, it is groups of objects and things, groups of animals, groups of boys and girls, forms of hills, dales, plains and trees, which must have their po-



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sition in the picture. Position includes perspective and composition. *Position* shows how to put objects in a definite place; *perspective,* how to place them different distances away, and *composition,* how to arrange them in a pleasing group. In Fig. 1 each part of the head, eye, nose, mouth, chin, ear and hair has its place. If one wishes to learn how to draw the human head, the first lesson would deal with the placing of each part.

General Principles. In Fig. 2 there are five balls and one apple. Ball F is at the right of the eye. Balls A and B are at the left of the apple. The apple and balls A, B and F are the same distance away (back). Therefore: Objects on the same horizontal line are the same distance away. Ball E is farther away than the apple; ball C is nearer than the apple. The farther away the object, the higher it rests in the picture; the nearer the object, the lower it rests in the picture.

It will be seen from the above that the element *position* has four principal directions from a given point: To the right, to the left, farther, and nearer than the apple, or any given point.

The best objects with which to learn placing are apples and balls. The apple

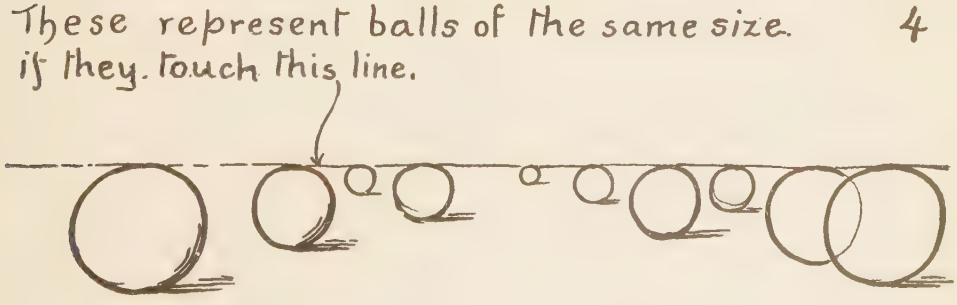
is the center, and the balls are to be placed right, left, farther and nearer, following definite exercises.

Work out such exercises as these: Draw an apple. Place one ball at the right and two farther away. Draw an apple. Place one ball at the left, three farther away and one nearer. Work out about twelve exercises of this nature.

Use models. Progress is more rapid with models than without. Round objects, such as apples, balls or oranges, may be used. The use of the model is to verify what you learn in the drawing. You need not draw from the model, but use the models to verify or prove your drawing.

After some power is gained in placing the balls and apples, then other objects may be used, as, for example, the deer and trees in Fig. 3. Here the deer takes the place of the apple as a center, and the trees are placed right, left, farther and nearer.

Croquet balls and a stake, one black marble and a number of lighter ones, a tree trunk and apples, pears or other fruit, all make excellent models with which to learn placing.



PERSPECTIVE.

Perspective is a branch of Position, and tells about representing objects different distances away.

The simplest way of teaching and learning perspective is arbitrarily to represent the top or a definite part of the object as being level with the eye. This level of the eye is indicated by a light horizontal line, as shown in Figs. 4 and 5.

The method gives perfect perspective, and by using it one learns perspective

to the extent that objects near and far away can be represented with ease and with a fair degree of accuracy. The process is as follows:

Draw a light horizontal line, as in Fig. 4. This line represents the level of the eye and is called the horizon line.

Draw balls of various size, making the upper edge of the balls touch the horizon line. Then it makes no difference how large or how small the balls may be drawn, they are in perfect perspective. The line under the ball indicates the surface of the ground and marks the position of the ball. The balls are in reality the same size, the farther ones being drawn smaller because farther away.

Use heavy lines for the nearer balls and lighter lines for those farther away.

Make the nearest ball about one inch in diameter on paper, and on the blackboard about five inches in diameter.

Use balls when studying a principle. Why? Because balls are easy to represent, and have so little personality that the attention is not attracted to them sufficiently to lose sight of the more important element, principle. But the same principle is applicable to other objects in the same manner as to the balls. In Fig. 5 are wigwams. By placing the top of each even with the horizontal line, perfect perspective is represented.

When drawing tall objects, like trees and houses, part may be placed above the horizon line and part below. In A, Fig. 6, the tops or foliage part of the trees are drawn above the line and the trunks below. The trunks are of the same length. In B, the main or rectangular part of the houses are drawn below the horizon line, and the roof or triangular part above the line.

In B, the farthest house has a tree at the right of it and one farther away. Objects may be placed at the right, left, farther and nearer than a given object, the same as in placing.

To learn perspective one may draw such exercises as the following: Draw six balls various distances away. Draw five trees various distances away. Draw four houses various distances away. Work such exercises as these until you have acquired the skill necessary to represent objects various distances away.

Of course, using the horizon line is a means of learning perspective; in nature

PERSPECTIVE — Place the roofs and tree tops above the horizon line, and the tree trunks and main part of the houses, below.

objects are not cut by the horizon line like this, but after you have learned how, then the irregularity of nature may be taken into consideration.

Composition is arranging objects in a pleasing group. The most simple pleasing arrangement is triangular. In A, Fig. 7 is a triangle and below it are three balls, one on each angle of the triangle, and still lower down, in G, are the trunks of three trees arranged in the same manner. In like manner, B, C. D, E and F show the different arrangement of triangles; under each triangle are the balls grouped in the same manner, and below these is a composition illustrating the group. Thus, group H corresponds to B; I, to C; J, to D; K, to E; and L, to F.

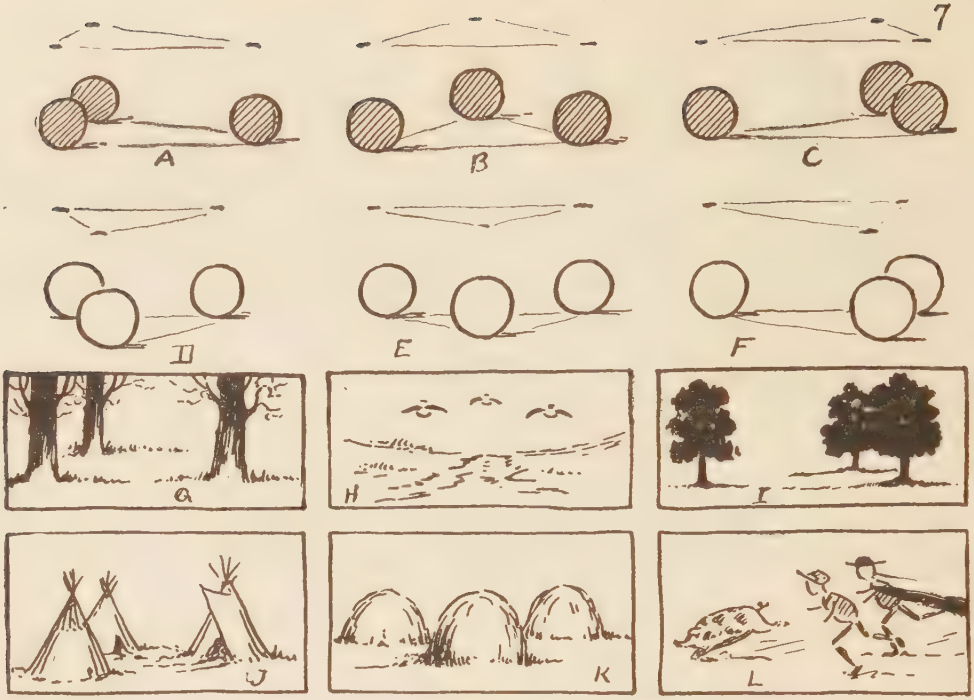
Grouping may be learned by composing such exercises as these: Make a group of trees based on triangle A, triangle B, triangle C, and so on.

DIRECTION, OR THE SURFACE OF OBJECTS.

Direction tells about the surface of objects and the various lines that indicate surface.

Direction also indicates action—the action of growth as seen in growing plants; the action of inanimate form as seen in the movements of animals, and the action of rhythm as seen in graceful movements.

Direction is indicated by lines. It is the office of a line to show direction. A vertical line indicates a vertical direction or surface; a horizontal line, a horizontal



COMPOSITION—A simple grouping of three objects.

direction or surface; an oblique line, an oblique direction or surface, and a curved line, a curved direction or surface.

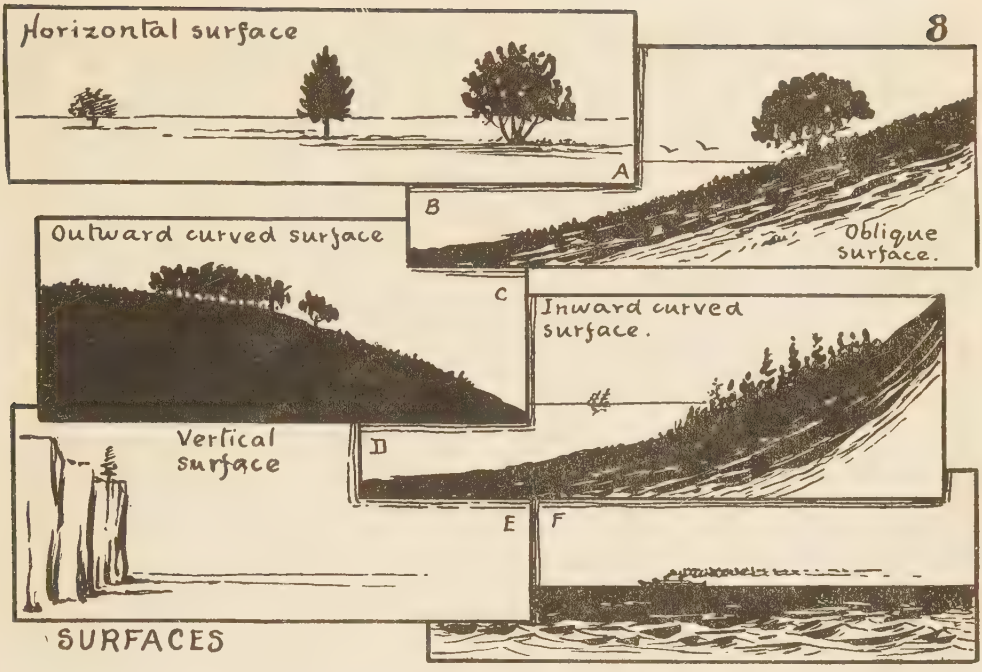
The principal directions that lines may take are, therefore, vertical, horizontal, and oblique, and are indicated by the vertical, horizontal, and oblique straight and curved lines.

In A, Fig. 8, the trees rest on a horizontal surface indicated by the horizontal lines; also in F the horizontal horizon line suggests the horizontal surface of the water. In B the single tree rests on an oblique surface suggested by the oblique line of the slope. In E the vertical lines of the cliff suggest their vertical surface. C represents an outward curved surface and D an inward curved surface. The representation of surfaces may be learned through such exercises as these: Draw an apple resting on a horizontal surface; on an oblique surface; on an outward curved surface; on an inward curved surface. In like manner represent other objects on the various surfaces, such as trees, wigwams, posts, balls and houses.

Lines: In Fig. 10 are shown the lines used in drawing. Of the above lines, the first group, the unaccented lines, are learned first. These should be learned before the accented group is taught at all. In general, use the heavy lines in the placing of objects, and the light and medium lines in perspective.

The graded line is the most important line used in drawing. It is the most rapid, the most serviceable, and the most pleasing of all the lines. This line should be learned, however long it may take, or however great the exertion put forth in learning it. Learn to draw it from light to heavy, or from heavy to light, at pleasure.

In Fig. 11 are examples of the graded line which show how much may be ac-



complished at each stroke. Observe that the stems are made with a single stroke, and that the joints are represented by a space. Practice these lines until learned.

The *emphasized line* is a line accented by drawing one or more lines parallel and close to it, in such a manner that the general effect is that of one line or direction. Important lines and round surfaces should be emphasized.

The *broken line* is to indicate a broken surface, such as the roughness of ground, the irregularity of grass, the broken appearance of stone, or the bark on tree trunks. Both the broken and emphasized lines may be and usually are graded.

All that is truly great comes to us by slow degrees. It is the same in acquiring these lines. There is the least character in the unaccented lines, and the most in the accented; hence these latter are more gradually acquired, and of these the broken line seems to be the last one to be learned.

The different lines should be learned so well that they can be used at any time and in an almost automatic manner. Lines are the words of the drawing language. If they are not learned, they cannot be used, or if learned imperfectly, their use will be labored and imperfect. Learn these lines, and learn them now.

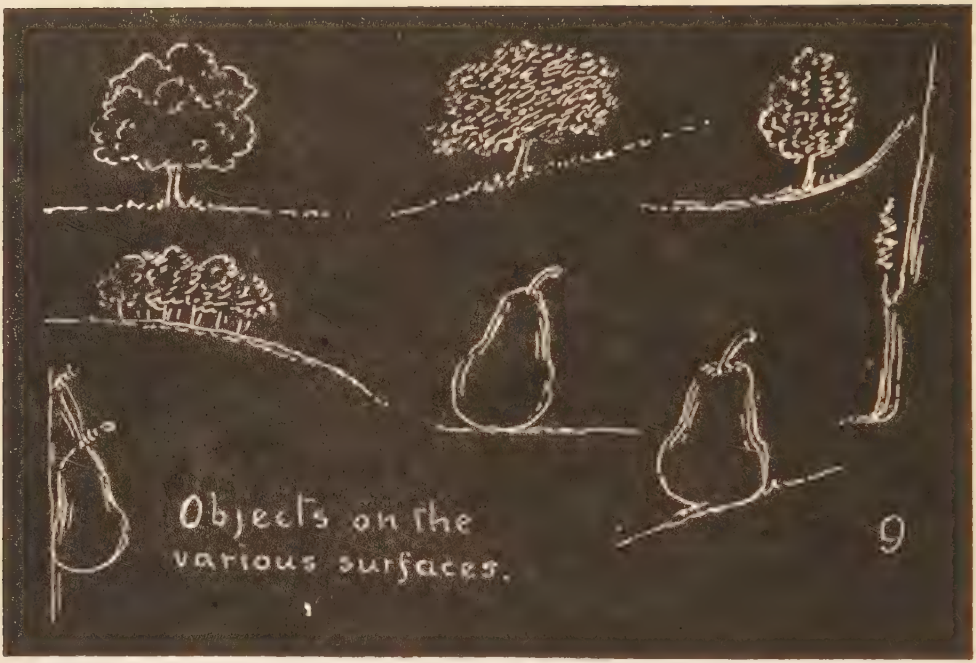
The birds' nests in Fig. 12 are examples of the broken line. The broken line is learned largely through the copy.

Action Drawing. Action is that part of direction that relates to motion. In a general way direction implies motion, and motion in drawing is largely indicated by lines.

Lines not only express action, but each line has a leading expression of its own that is of vital and far reaching use in action drawing. These expressions are as follows:

Vertical lines are the "still" lines. They express stillness, but when in motion they express vertical motion, as seen in falling water, rain and snow.

Horizontal lines are the "sleep" lines, and suggest repose; but when in motion they express horizontal motion, as ripples in still water.



Oblique lines are the "go" lines, and express movement more than any other kind of line.

Curved lines are the "grace" lines. They express graceful movement and harmonious action.

Parallel lines are the "order" lines. They express order. When the hair is combed, the lines are made parallel. Parallel lines when in motion express uniform motion.

Angular lines are "discord" lines. They are the lines of disorder and express violent action, as in explosion; awkward action, as in clumsy movement; and disorder, as in untidy hair.

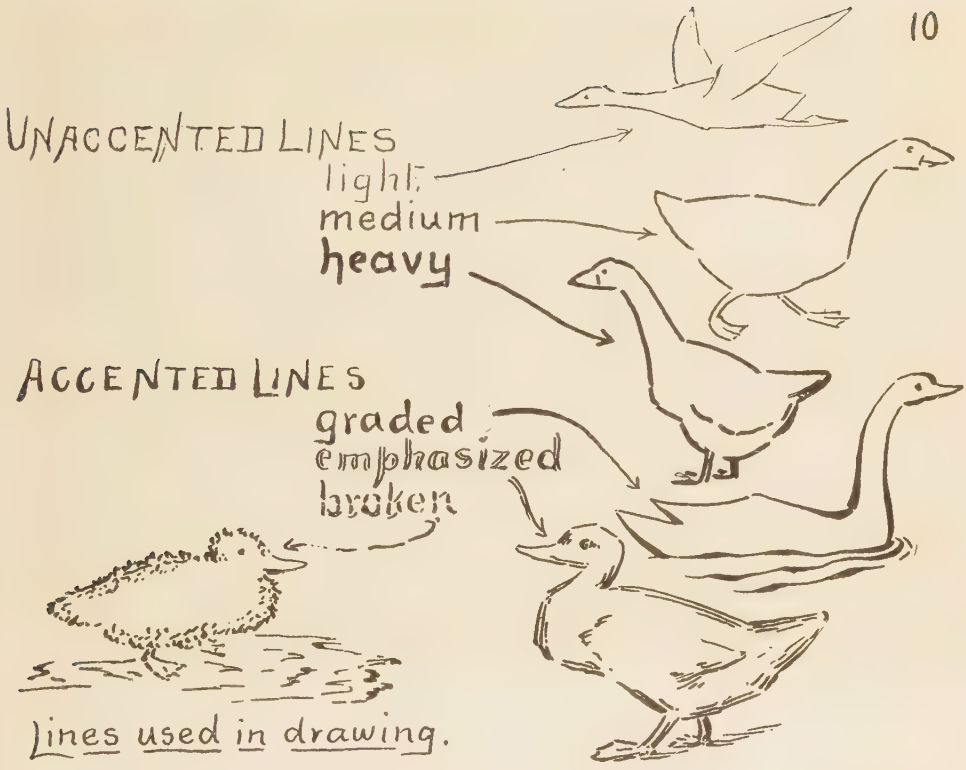
Method of Teaching Action. Action is taught through the copy. It is practically impossible for the average draughtsman to learn action through the object that expresses the action. There is not a movement of an object, or animal, so slow that it can be grasped by a learner to the extent that he can transfer it to paper; hence, first efforts, at least, in the learning of action should be from the copy. An excellent plan is as follows:

First: Learn how to express the action from the copy; that is, learn the mechanical process—the lines that represent action and the method of using them.

Second: Use the action thus learned in memory and imaginative work until the action can be represented with some degree of facility.

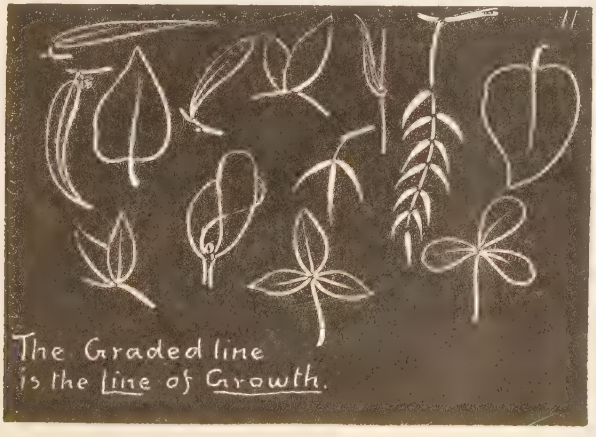
Third: Use direct observation to verify, correct and perfect the action until it can be represented with both facility and accuracy. These three steps are not widely separate, but may occur in the same lesson.

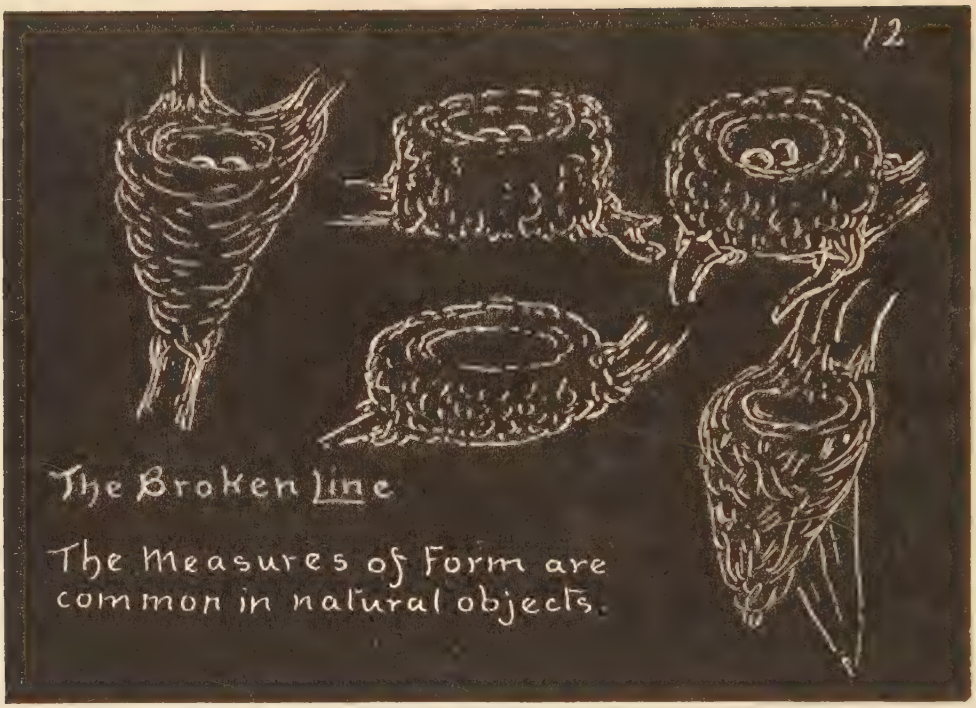
For example, we will choose the action of running. There are many phases of running, but perhaps that represented in A, Fig. 14, is as simple as can be made. Learn this action by carefully copying A, and then for practice, draw an Indian boy running, B; then a Chinese boy, C; a sailor boy, D; and a soldier boy, E.



Then take another phase of running, as shown in F. In this phase the knee joint is represented by a space. A space can represent an idea as well as a line. To learn this, first carefully copy the action; then represent a summer boy, F, running; then a winter boy, G; then a colonial boy, H, and so on until the action is learned.

Action is impersonal, that is, it is not a part of the object that expresses the action. Character belongs to the object, to the individual; character and action we often think are one and the same. The action of running is common to all ani-





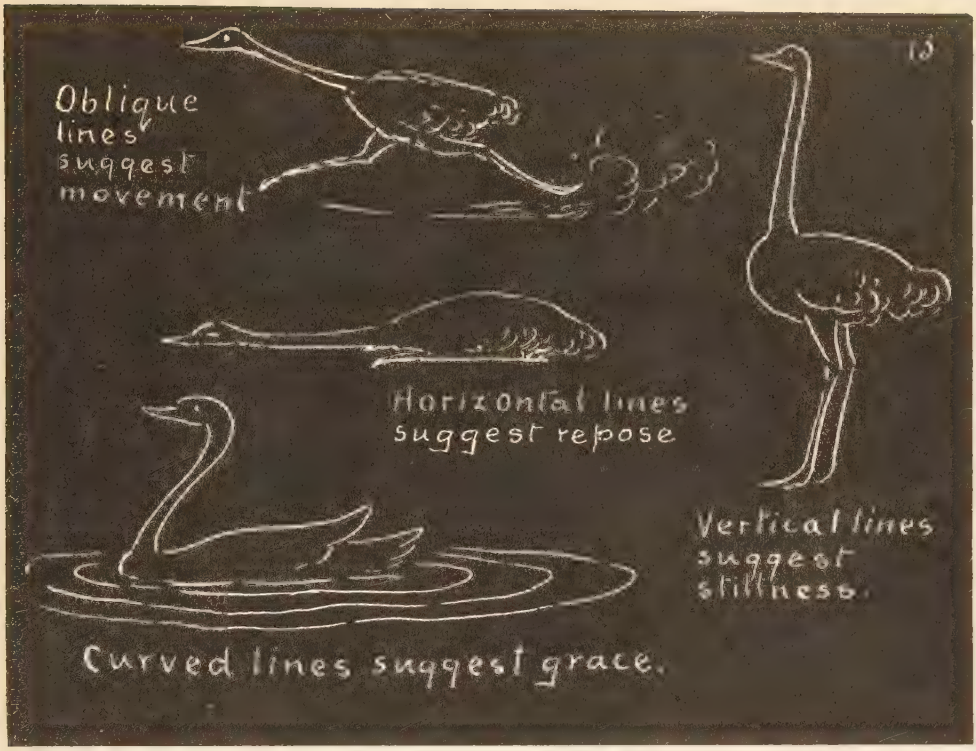
mals alike, but the character of the run belongs to the individual. For example, the running of a turkey, a goose, a hen, a dog, a cat, and a squirrel are in principle the same, but the character of the run is so different that we recognize each one at a glance.

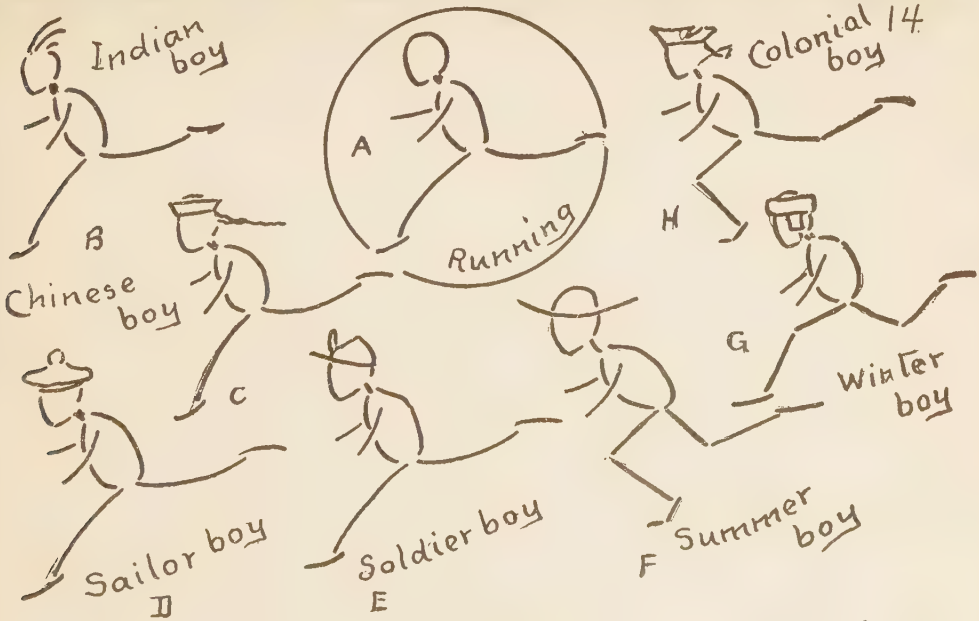
In Figure 15, A represents the action of running; in C it is applied to an ostrich, in D to a goose, in E to a hen. Then, by taking the two hind legs as one, and the two fore legs as one, the same action is applied to a deer, a horse, a pig and a dog.

Broadly speaking, there are five great groups of action, under which nearly all phases of action may be placed. They are the running group, the walking group, the standing group, the sitting group and the reclining group. For example, dancing and jumping would be classed under the running group.

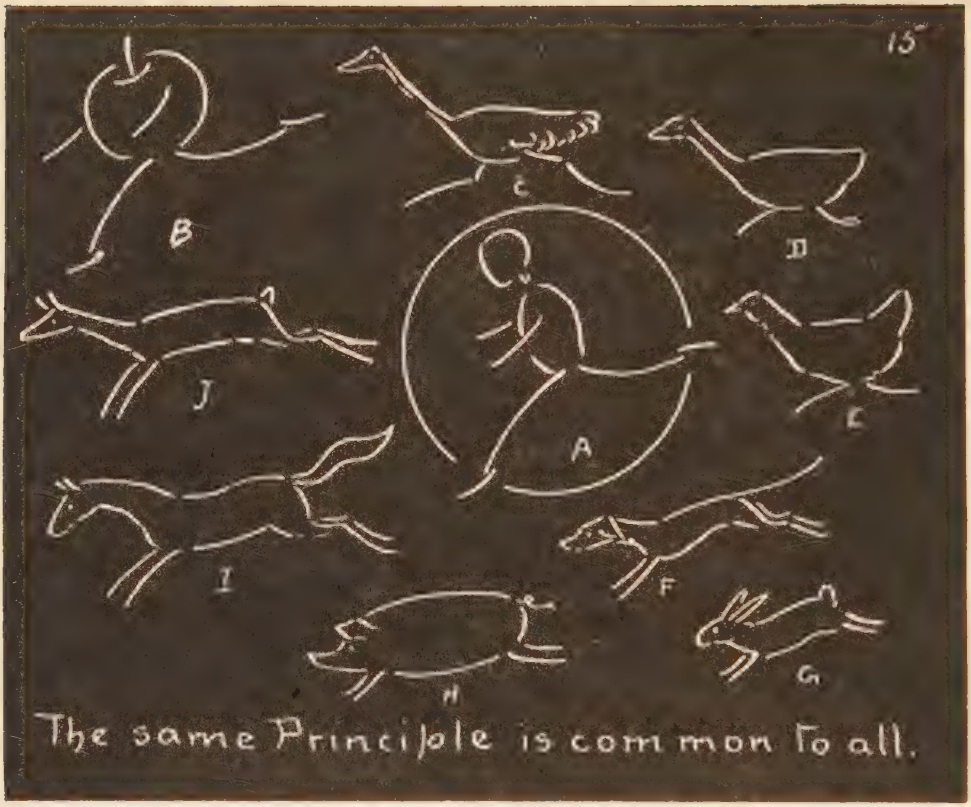
In the running and walking groups, the "go" or oblique lines predominate; in the standing group, the "still" or vertical lines predominate; in the reclining group the horizontal lines predominate, and in the sitting group the vertical and horizontal lines unite. The "grace" or curved lines would predominate in dancing, "order" or parallel lines in the marching of soldiers, and angular lines in a fight.

The Action of Rhythm. Lines not only show direction, and suggest motion, but they may represent rhythm. Rhythm is graceful motion, and in drawing is indicated by graceful lines. All nature is full of rhythm. We see it in the waving grain and bending trees, in the motion of water and the swirl of smoke, in the markings on the feathers of birds, and in the graceful folds of drapery. It is seen in the movements of a kitten and in the color of a lily; it is heard in the call of a lark and in the grand roll of thunder. It is all about us. It is in the graceful or rhythmic motion of sound, color and form.



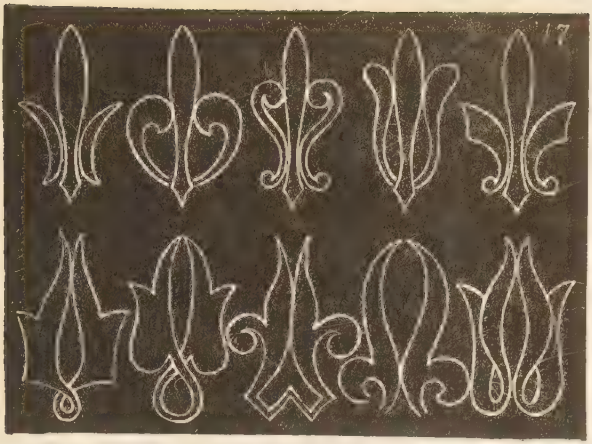


The Action of Running



Rhythm finds its expression in skill, in rhythmic skill. Rhythmic skill is doing things easily, quickly and gracefully. Decorative design is that department of drawing which deals with the ornamentation of forms, and has for its basis rhythmic skill.

A good way to acquire rhythmic skill is through two-handed drawing on the blackboard. Fig. 18 shows the method, and Fig. 17 shows some excellent examples to practice.



Decorative design relates to the ornamentation of form, and the designing of form in which the decorative element is primary. In Fig. 19 are represented the line elements in decorative design.

The single and double curves are to modify form, as for example, in Fig. 20, A is a rectangle; in B, C, D, E, F and G, the single curves, both inward and outward, are substituted for the vertical lines of the rectangle; and in I, J, K, L, M and N, the double curves have been substituted.

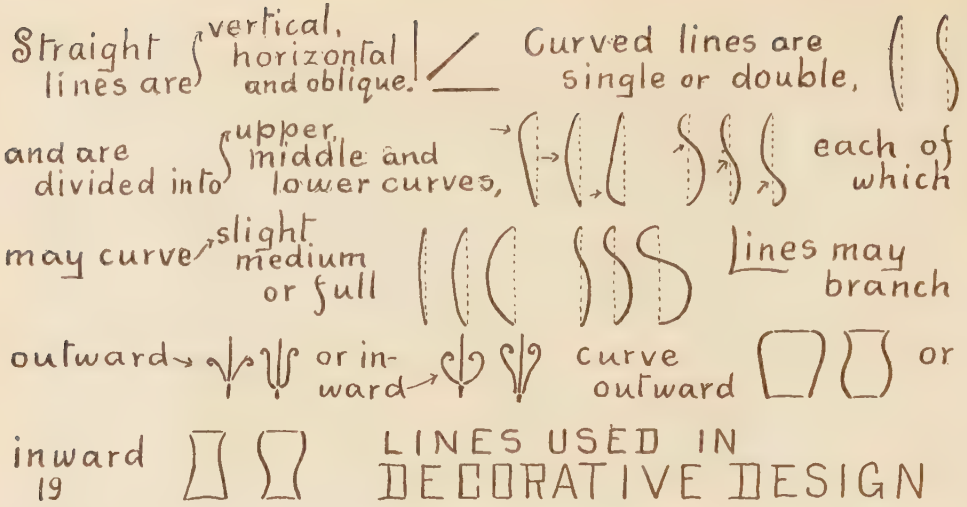
An inward double curve is one that curves in at the top, and an outward double curve is one that curves outward at the top.

O, P, Q, R and S are pitchers made from the above forms.

Branching is of two kinds—outward and inward. Outward branching is the branch curving outward from the main stem, as A, Fig. 21. The shorter curve is the branch. Inward branching is the branch curving inward toward the main stem, as B, Fig. 21.

D is an example of inward branching, and all the others are examples of outward branching.

These branching elements are fundamental in character, and are the basis of


Straight lines are vertical, horizontal and oblique.
Curved lines are single or double,
and are divided into upper, middle and lower curves,
each of which
may curve slight medium or full
Lines may branch
outward or inward
curve outward or inward
19
LINES USED IN DECORATIVE DESIGN

an infinite number of combinations running through the entire subject of decorative design. To draw these curves and branches with facility requires much practice and persistent effort, but so important is it that these elements be acquired, that almost any amount of application and hard work is justifiable in their acquisition. The designer must acquire the ability to draw these curves and branches with ease, freedom and skill.

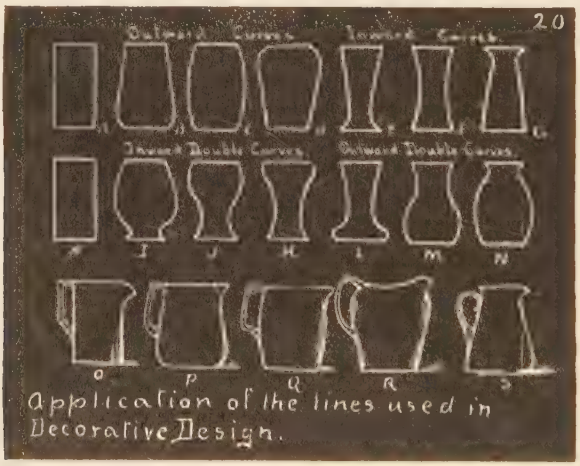


Fig. 22 represents the chief form elements used in decorative design and the three ways of applying them. The geometrical forms are the same as those used as measures of form. These forms are used in the planning of ornaments, and as form measures in making designs. The use of these forms is shown in the following discussion on form:

A unit in decorative design is one of the parts used in making up the design. The sources of units are as follows:

The geometrical forms, such as the triangles, rectangles, diamonds, circles, ellipses and ovals.

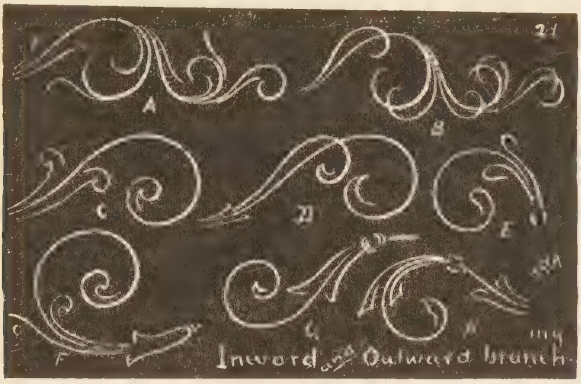
Plant forms, such as the branch, stem, leaf, bud, flower, fruit and root of any kind of tree, shrub or plant.

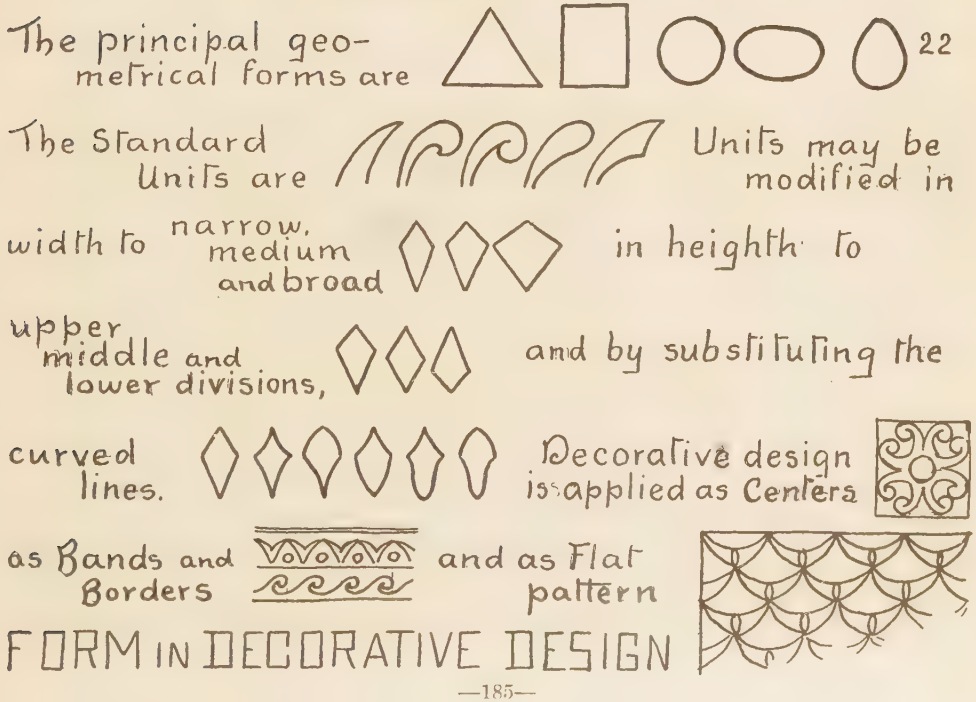
Animate forms, as the head, body, legs, tail and product of all kinds of animals, birds and insects, fish and reptiles.

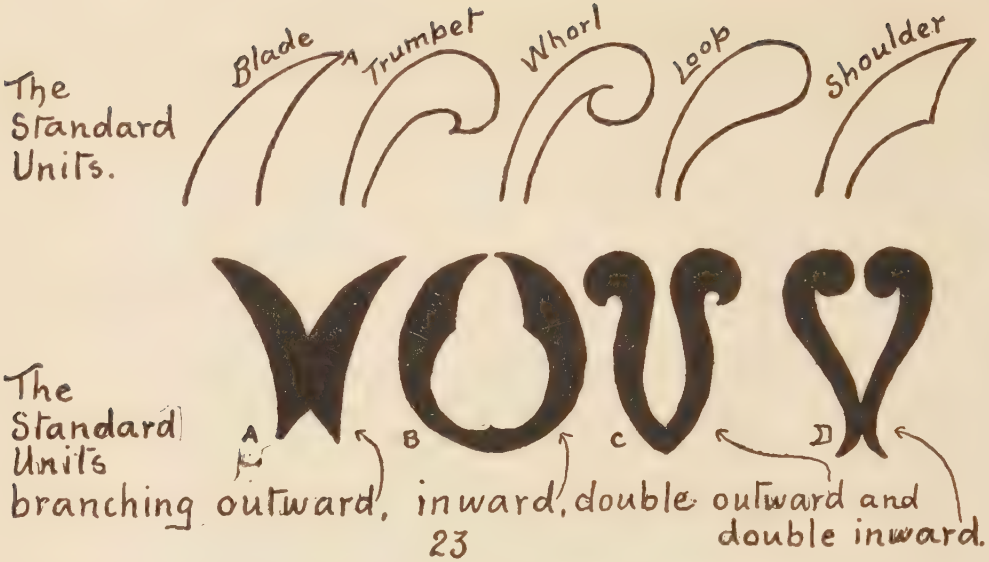
Natural forms, as water, snow, ice, icicles, waves, running water, smoke, clouds and wind, shells and minerals.

Artificial forms, such as ribbons, flags, streamers, banners, ropes, chains, in fact, any object made by man.

It will be seen from the above that it is quite impossible to give even a superficial list of the units that may be used. Yet, while this is true, there are certain elements common to all decoration that have their origin in the experience of the




The principal geometrical forms are
22
The Standard Units are
Units may be modified in
width to narrow, medium and broad
in heighth to
upper middle and lower divisions,
and by substituting the
curved lines.
Decorative design is applied as Centers
as Bands and Borders
and as Flat pattern
FORM IN DECORATIVE DESIGN



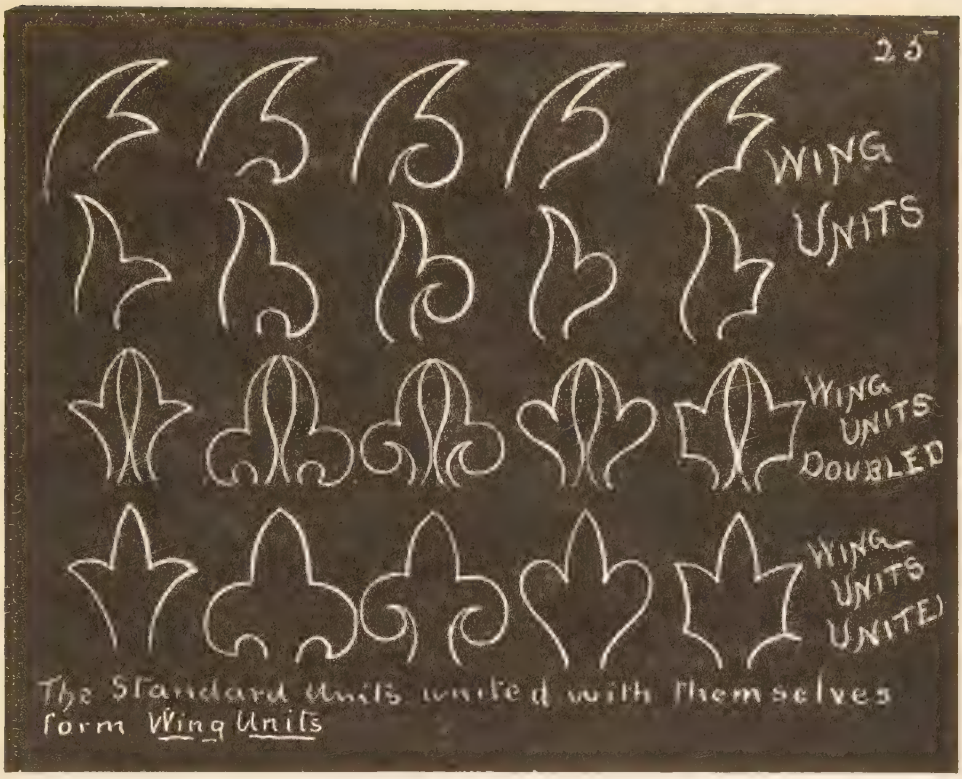
23

past, and have been handed down to us as the fruit of successful experience.

These elements, as near as possible, have been reduced to their most simple form in the five standard units, A, Fig. 23. These units are the result of many years of research and study, and include nearly all the elements used in historic ornament and modern decoration.

These units are so fundamental in character that through them we can learn to use any unit or form, however varied or complex it may be.

These standard units are very similar in their construction, and have elements that are common. The two main lines of each are examples of outward branching.



Carry the point A of the blade around farther, and the trumpet is formed. Carry it still farther and the whorl is formed. Eliminate the point entirely and the loop is formed. Add to the blade another point and the shoulder is formed.

The names of the standard units are given from a real or fancied resemblance to the object after which they are named.

These units are classic, and therefore universal in their application. They can be applied to centers, borders, bands, flat patterns, covers, supports, or any other form of decoration. They will be used throughout this course; therefore they must be fully memorized. We must know them as a carpenter knows his tools.

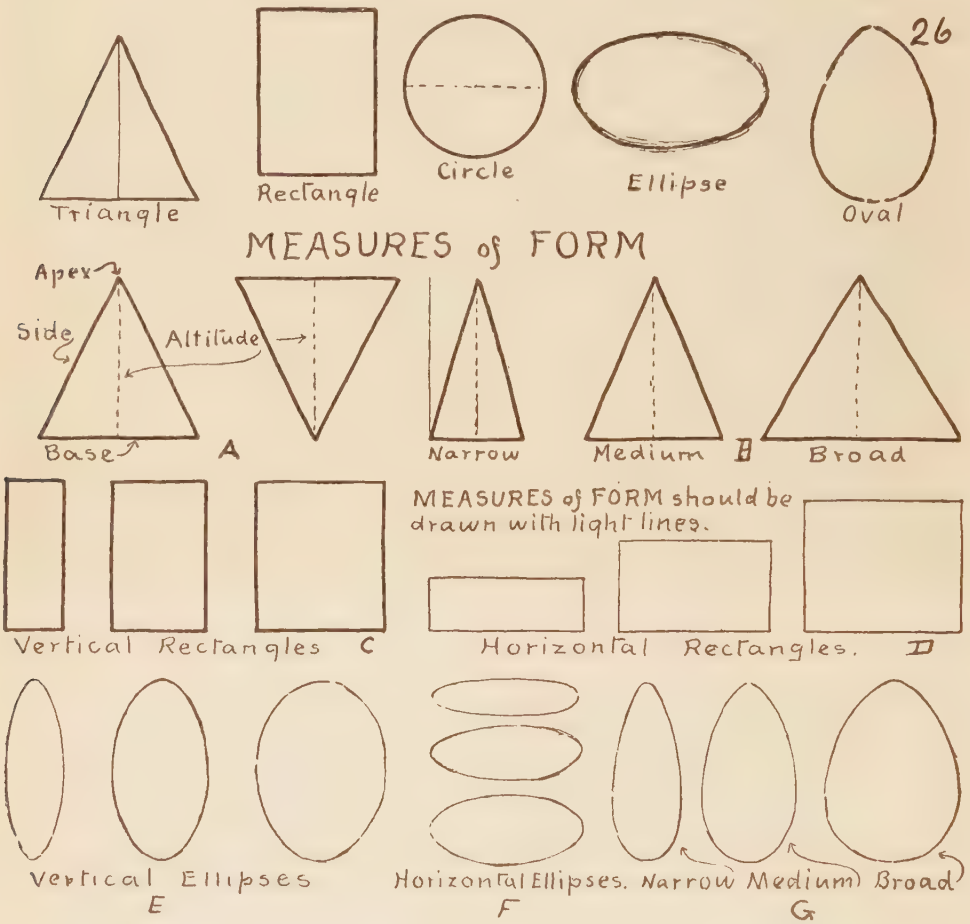
The combinations of these standard units are practically unlimited. Their elements enter into nearly every form of decorative design.

They can branch outward, as in A, Fig. 23; branch inward, as B; branch inward with double curves, as D; and outward with double curves, as C. In Fig. 24, the loop is shown in each of these branchings. Fig. 24 represents the Greek anthemion.

The standard units can be combined, as shown in Fig. 25, forming wing units. The first and second rows represent the blade united with each of the standard units. In like manner each standard unit may be united, thus forming endless combinations.

The standard units, the single and double curves with their inward and outward branchings, and the geometrical forms are together a complete set of tools with which to work in decorative design. They are decorative words to express decorative thoughts, figures of design to work out problems of ornamentation. They

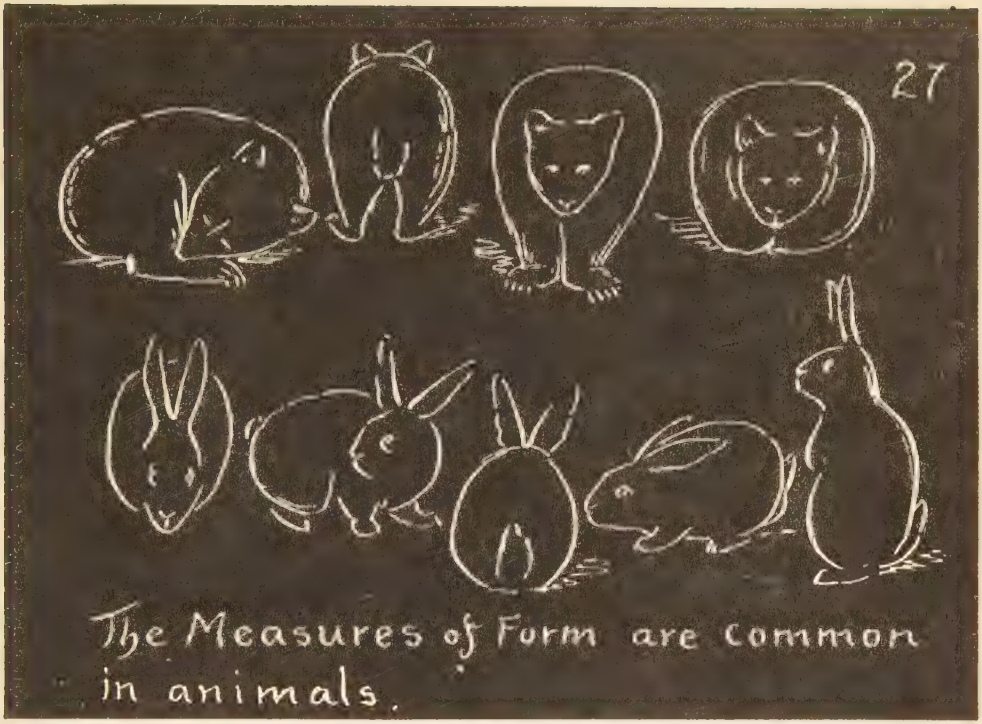
are servants of the mind, and as such the greatest liberty may be taken with them; they may be added to, subtracted from, multiplied, divided, or modified in any way the mind may devise. There are no more elements to be given; the list is complete. All that now remains is to make these tools our own until they become willing and obedient instruments in our hands. They have infinite use, and can be applied to all decoration.



FORM.

The Measures of Form. Form tells about the shape of objects. The most simple forms that can be seen, recognized and named are the triangles, rectangles, circles, ellipses, and ovals. These forms in mathematics are called geometrical forms, and in drawing, type forms; but a still better name is measures of form, for their use in drawing is to measure form. They are the standards, or measures, of form very much as a pound is a measure of weight; a gallon, of liquid, or a dollar a measure of money.

The circle can be modified only in size, but the remaining measures of form may be made narrow, medium and wide, as shown in Fig. 26. The triangle may be drawn with the apex pointing upward or downward, as in A. The rectangle

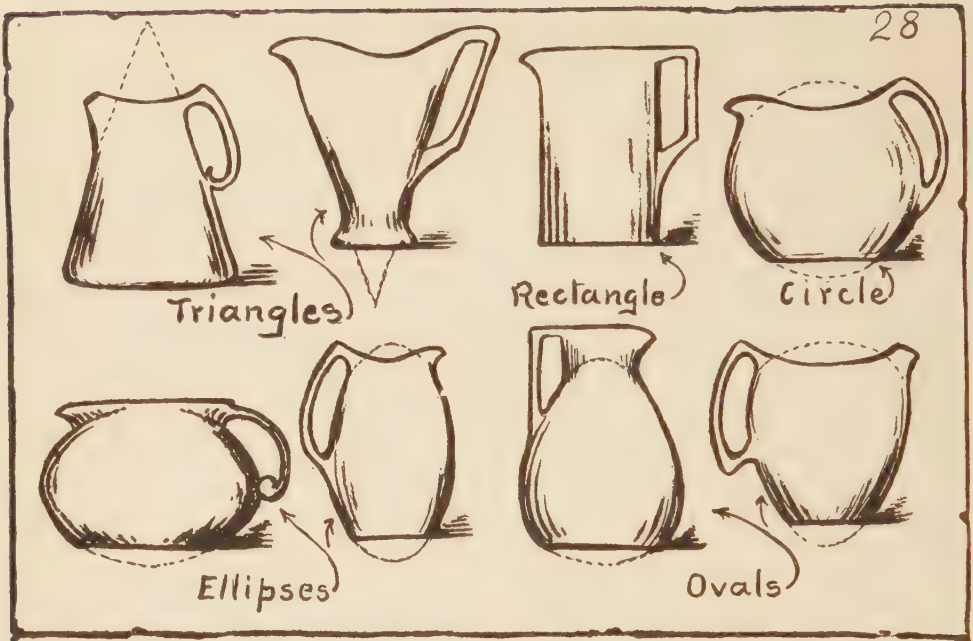


may be vertical, as in C, or horizontal, as in D. A vertical rectangle is one longer vertically, and a horizontal rectangle is one longer horizontally. Ellipses may be drawn vertically and horizontally, as in E and F. The oval may be inverted. There are other modifications, but these are the ones mostly used in the measures of form.

Right means *straight; acute* means *sharp;* and *obtuse, dull. Tri* means *three,* hence *triangle* means a *three-angled figure. Rectus* means *right,* hence, *rectangle* means a *figure composed of right angles. Apex* means *top;* base, *bottom,* and *altitude, height.*

The uses of measures of form are to aid in recognizing and grasping the shape and proportion of objects, to the extent that they can be reproduced in drawing. They also aid in making complicated objects simple and easy to grasp as a unit. These geometrical forms are measures of form in the sense that we recognize other and more complicated forms through their aid. These measures of form are common in all form, both natural and artificial. We see them in the shape of trees, plants and shrubs; of leaf, bud, flower and fruit; in the shape of bird, animal and reptile, and in what they make. The hills and dales, forms of water, great clouds, the broad masses of light and shade, are all full of these simple form measures. The architect combines them in endless variety and ever changing proportion; the engineer in his greatest works and most complicated problems never departs from the simplicity of these form measures. The carpenter, the blacksmith, the cabinetmaker, the tailor, the dressmaker, artist and artisan, from the designer of the greatest sky scrapers to the humble workman who digs the foundation, base their work on these simple fundamental forms.

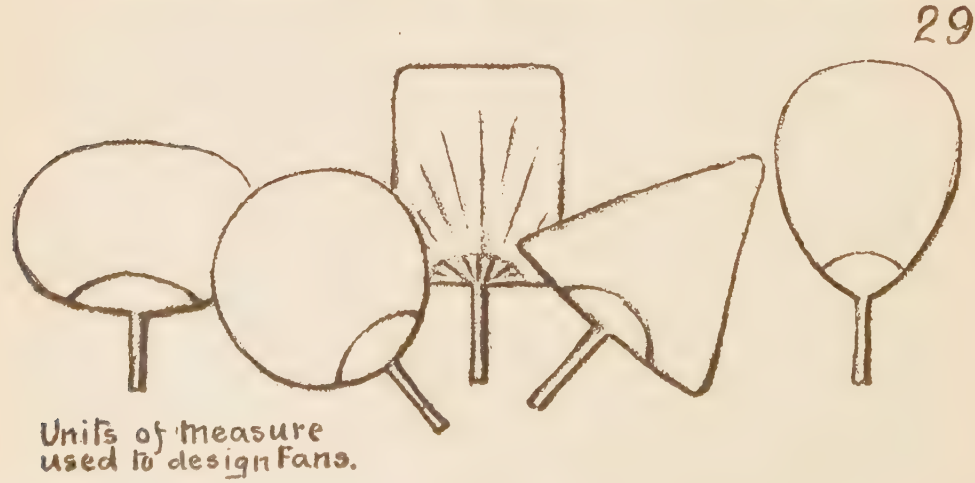
In Fig. 5 the triangle is seen in the wigwams. In Fig. 6 these forms are seen

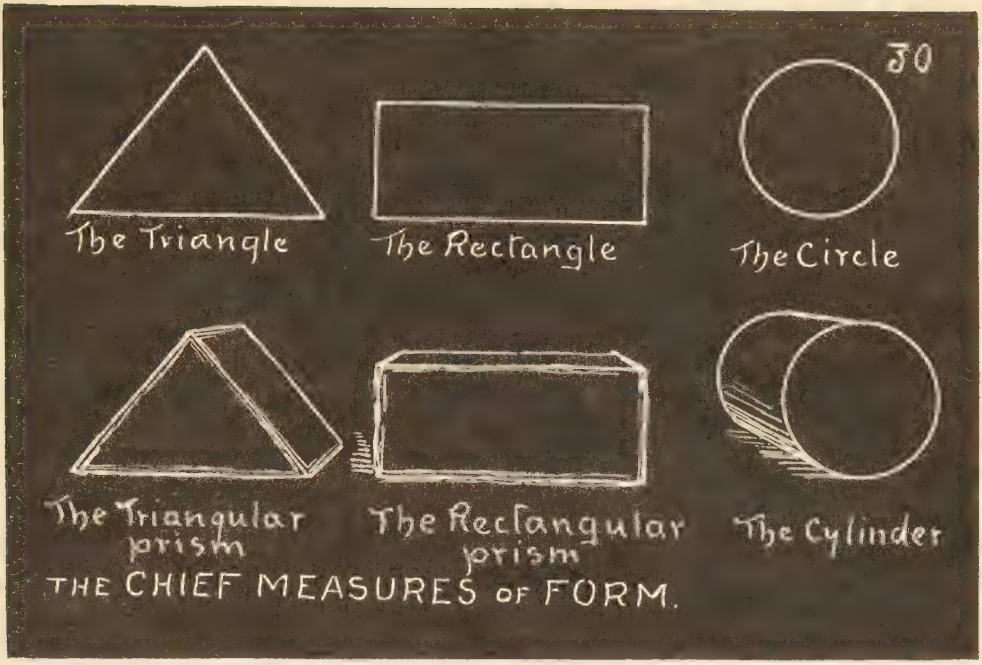


more or less in the tree tops and the houses. They are common in Fig. 9. The birds' nests in Fig. 12 are triangular, rectangular, round, oval and elliptical, and in decorative design they are the fundamental forms.

In Fig. 28 the forms are used in designing a pitcher. In like manner they could be used in designing any other object.

Drawing the Measures of Form. A measure of form to be used must be





thoroughly learned—learned so well that it can be drawn easily and quickly. The best way to learn these forms is to draw them.

All measures of form should be drawn with light lines—with sketch lines. These forms are not an end in themselves, but merely a means to an end, and for that reason should be drawn so lightly that it will not be necessary to erase them in the completed drawing.

Draw these form measures offhand, without the aid of ruler or compass, and with the minimum of guide lines, dots and other devices. Draw the ellipses, ovals and circles without aid of any sort. It can be done. At first the results are discouraging, but as the student gains in power and acquires the swing of the lines, his efforts become more and more accurate until crowned with success.

Draw the measures of form about two or three inches long on paper, and from fourteen to twenty inches on the blackboard.

When turning these measures of form into other objects, use a full range of line. Use all or as many of the lines in Fig. 10 as is necessary. The test of knowing these forms is the ability to draw them and use them as measures of form —to use them as measures of the great world of form.

An excellent way to learn these forms is to use them as measures of other forms. For example, procure a palm leaf fan; study it, draw it until you have learned how to represent it, then draw fans shaped like the various form measures. Do the same with a padlock, a pitcher, jug, teapot, sign board, and similar objects.

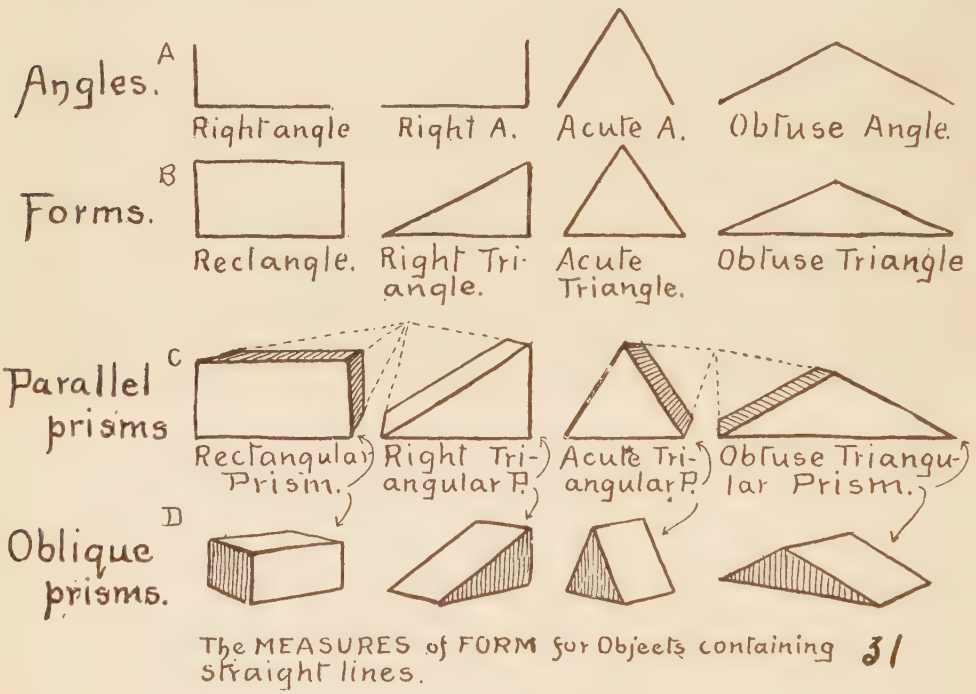
The Chief Measures of Form. The triangle, rectangle and the circle are the most important of the measures of form. By adding the third dimension to these forms, the prisms are made, giving the triangular prism, the rectangular prism, and the cylinder, which become the measures of solids.

The triangular prism is the form measure for objects containing oblique lines.

The rectangular prism, or box form, is the form measure for square-cornered objects.

The cylinder, including the sphere, are the form measures for objects containing curved lines.

In these form measures are represented the mechanical elements of drawing, and are the form basis of a vast range of objects that more or less embrace all form. These measures of form must be learned thoroughly; we must know them as we know the multiplication table, so well that they can be used instantly, without confusion or hesitation.



The MEASURES of FORM for Objects containing straight lines. 31

PARALLEL DRAWING.

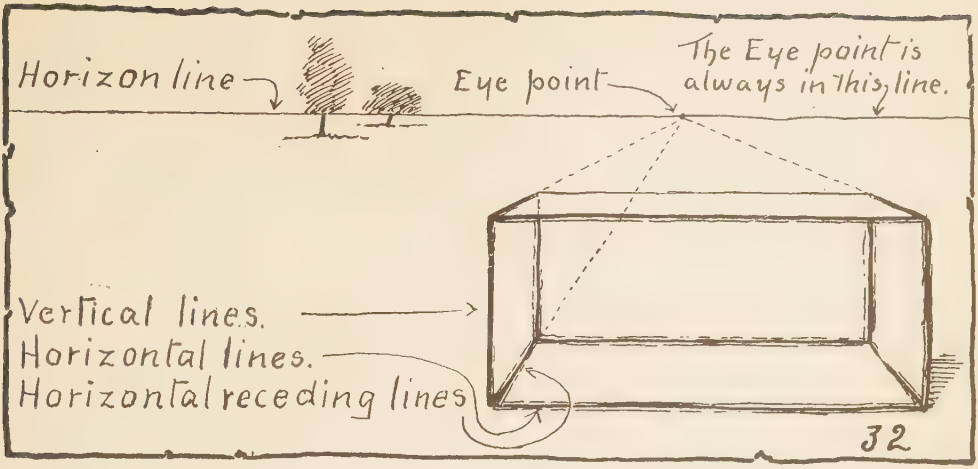
The Rectangular Prism or Box Form.

In Fig. 31 are represented the rectangle and the three most important triangles and their prisms. Read from the top downward, and in the first column we have, first, a right angle; then a rectangle; then a rectangular prism; then an oblique rectangular prism, showing the order of origin and the order in which they should be studied.

Parallel drawing, or as it is often called, parallel perspective, is represented by row C. *Parallel drawing* is representing objects with the front face parallel with the surface on which the drawing is made. This surface is called the picture plane.

Oblique drawing, or oblique perspective, is represented when the object is drawn at an angle with the surface on which the drawing is made.

Fig. 32 represents a box with the front face open and toward you. Procure such a pasteboard box and place it on the table before you in the same position and observe that the box has:



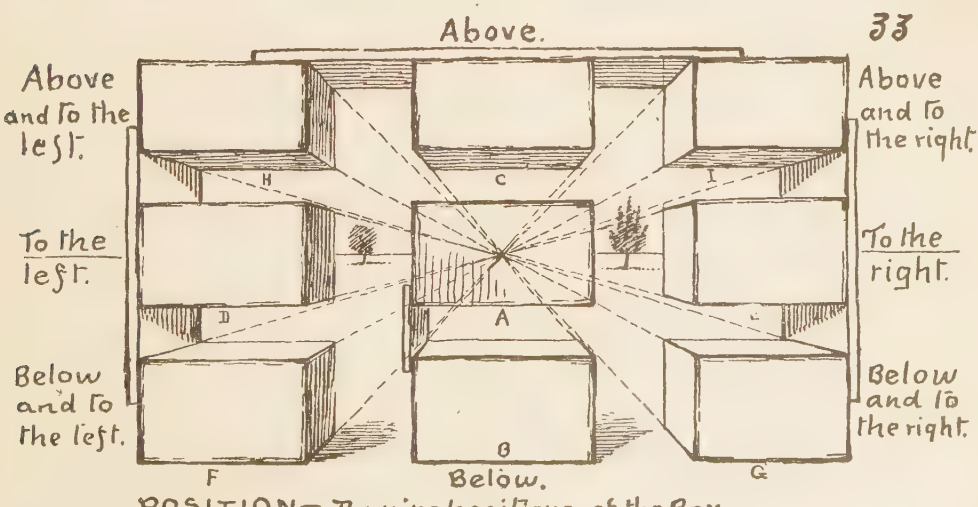
1. Six faces—Top face, bottom face, front face, back face, right face and left face.

2. Four vertical edges, four horizontal edges, and four horizontal receding edges.

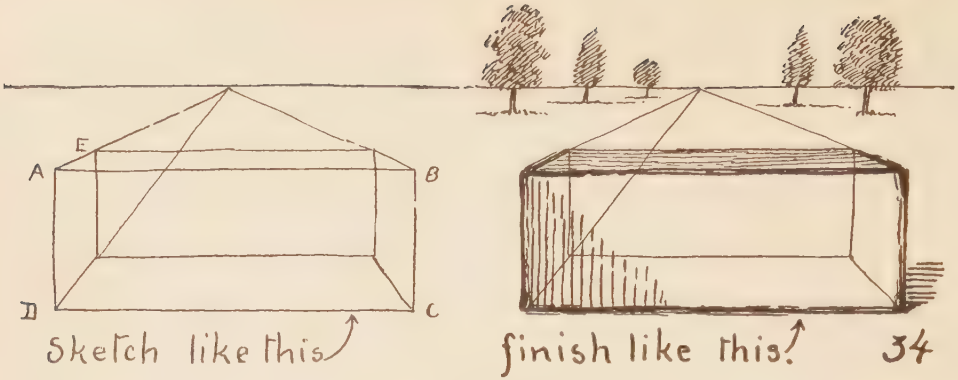
3. Twelve edges or lines in all. These lines are divided into three sets of four lines each: A set of four vertical lines, a set of four horizontal lines, and a set of four horizontal receding lines. The vertical lines are all drawn parallel with the sides of the paper on which the drawing is made; the horizontal lines parallel with the top and bottom of the paper, and the horizontal receding lines all converge to a point.

The horizontal receding lines converge to a point called the eye-point, or center of vision. This is an imaginary point directly opposite the eye, to which all horizontal receding lines converge.

The horizon line represents the level of the eye, and is often called the level-of-the-eye-line. The horizon line is to show whether the top or bottom of objects



POSITION— The nine positions of the Box.



can be seen. If the object is below this line, the top can be seen, and if above, the bottom can be seen. The horizon line always passes through the center of vision.

The center of vision, or eye-point, shows where the horizontal receding lines converge and also whether the right or left face of objects can be seen.

Observe in Fig. 33:

That the box can be drawn in nine positions.

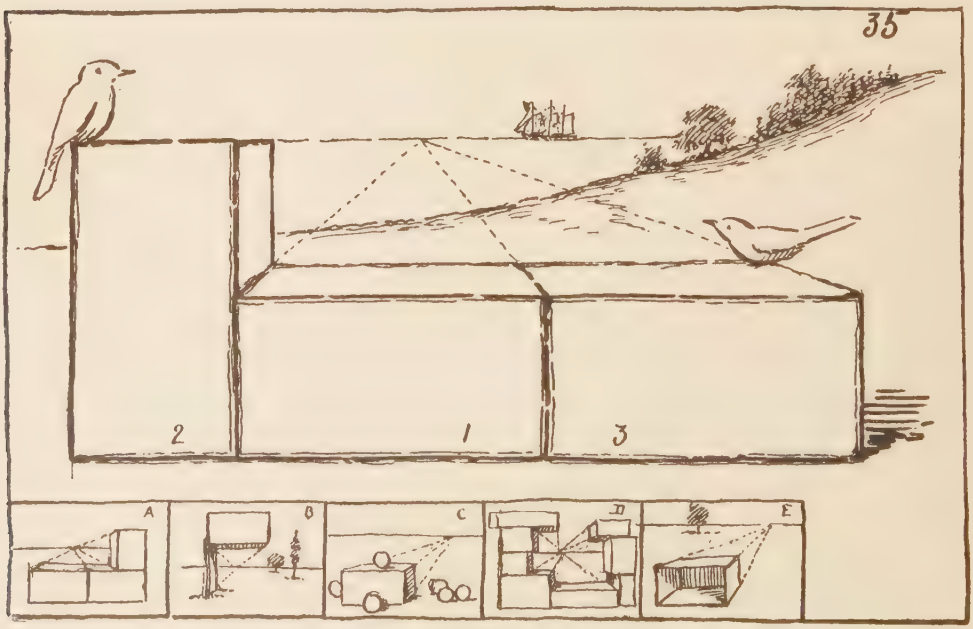
That when drawn above the level of the eye the bottom faces can be seen. (Boxes H, C and I.)

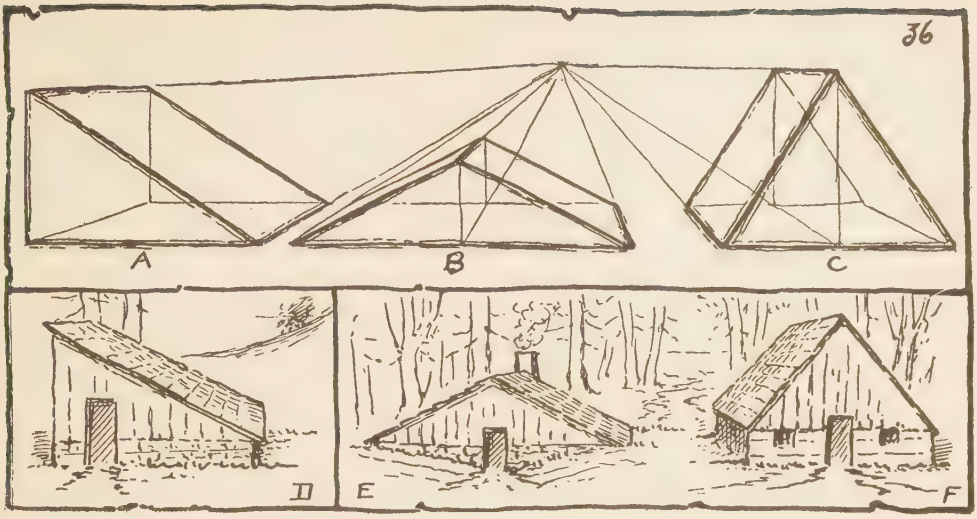
That when drawn below the level of the eye, the top faces can be seen. (Boxes F, B and G.)

That when drawn at the left of the eye, the right faces can be seen.(Boxes H, D and F.)

That when drawn at the right of the eye, the left faces can be seen. (Boxes I, E and G.)

That the vertical lines are all drawn parallel with the sides of the paper on





which the drawing is made; that the horizontal lines are all drawn parallel with the top and bottom of the paper, and that all the horizontal receding lines converge to the eye point, or center of vision.

There can be but one center of vision in each drawing.

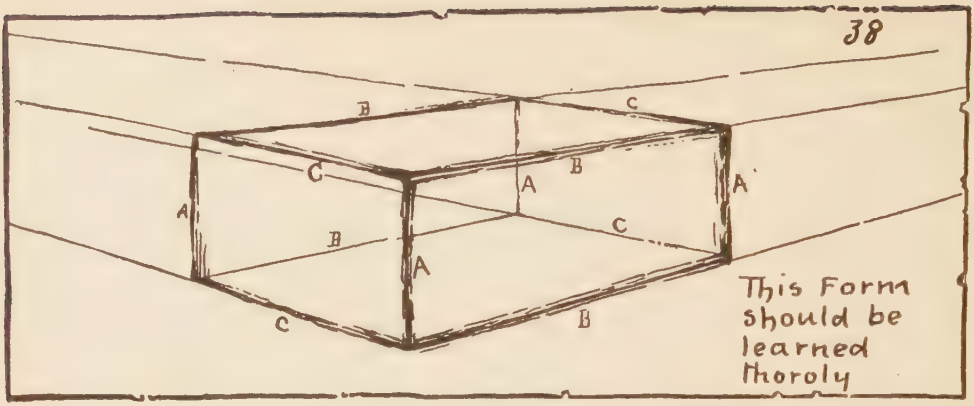
The box forms are drawn as follows:

(1) Draw the front face, A, B, C, D, Fig. 34.

(2) Choose the center of vision.

(3) Choose the point E and draw the remaining lines.

First make the drawing with a very light sketch line, then finish with heavier lines.



Do not use a ruler or straight edge.

Make the drawings on paper, about 1½x2½ inches. On the blackboard the drawings should be at least 7x12 inches.

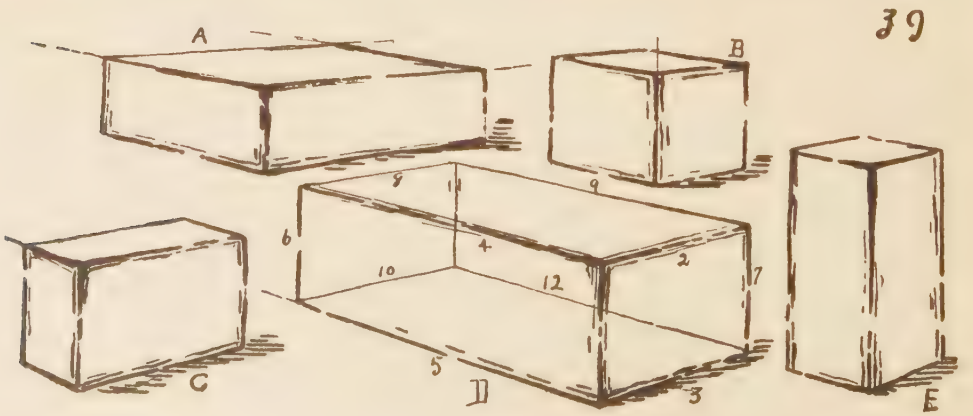
Use the model. Compare your drawing with a model, not so much to see if your drawing looks like it as to see if you have the correct principle.

Trees may be introduced into these drawings by placing the top, or foliage part of the tree, above the horizon line, and the trunk below it, as in Fig. 33.

The best way to learn these positions is to draw them. Practice exercises such as these: Draw a box below the eye; above the eye; at the right of the eye; at the left of the eye; below and at the left of the eye; above and at the left of the eye, and similar exercises. Introduce trees, balls and similar objects to make a picture effect.

Fig. 35 represents block or box 1 as drawn below the eye, block 2 added to the left face, and block 3 to the right face. In A there is a similar combination. In B there is a box drawn above the eye, and in C, one below and at the left of the eye, with balls placed on each side. In D boxes of all sizes are piled up around the center of vision, and in E there is a box drawn below and at the left of the eye and the front face removed. These are all suggestions as to how to learn in parallel drawing.

Make arrangement of blocks similar to A. An object above the eye shows the bottom face, and is supposed to be in the air, as the box in B. Place objects, as the balls in C, on various faces. The birds on the blocks in the large drawing are



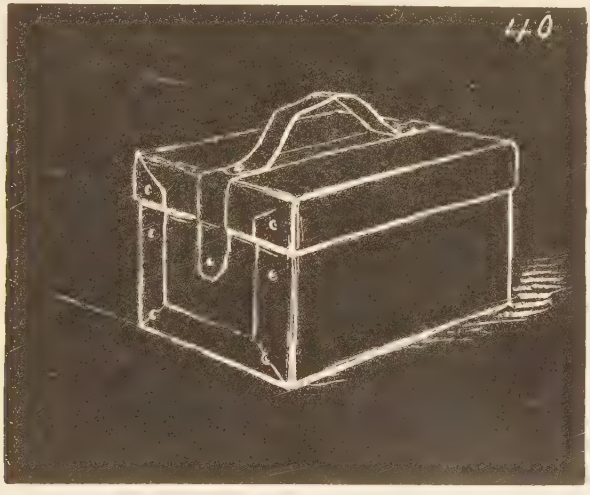
similar in principle to the placing of the balls in C. It is interesting to pile boxes promiscuously, as in D. Remove the various faces from boxes, as suggested in E.

A, B and C, Fig. 36, represent the triangular prisms, which are drawn in the same manner and obey the same principle as the rectangular prism. The rectangular and triangular prisms together make up the principal house forms, as shown in D, E and F. In Fig. 36, D is called a shed roof, and E and F, gable roofs.

These houses may be drawn in all of the positions represented in Fig. 33. A, Fig. 37, represents a house drawn at the left of the eye, and B, a shed at the right of the eye.

We have studied the angles and forms as shown in Fig. 31; then the prisms in parallel perspective, as shown in the third horizontal row, and now we will study the prisms in oblique position, as shown in the last horizontal row. The aim is to show how to draw straight-lined objects in an oblique position, or in oblique perspective, as it is often called.

In oblique drawing the center of vision is not used, neither are vanishing



points of any kind. The whole dependence is put on the unaided hand and eye.

The rectangular prism, as shown in Fig. 38, is the principal figure. This must be thoroughly learned. It must be drawn over and over until it can be drawn with ease and a fair degree of accuracy, for it is the basis of a large class of objects, and if this is learned thoroughly it becomes the basis of the whole class.

Place before you a common pasteboard box in the position of Fig. 38, and observe the three sets of lines, AAAA, BBBB and CCCC. The lines of the first set are vertical and parallel. The sets of lines marked B and C are receding and consequently converge slightly, but in the drawing they should not appear to converge, but should appear parallel and natural.

Draw the rectangular prism in the order of the numbers, beginning with line 1, then line 2, and so on, as shown in D, Fig. 39.

The faces are named top, bottom, right front, left front, right back and left back.

Draw all prisms and objects with light lines, and then finish with heavier.

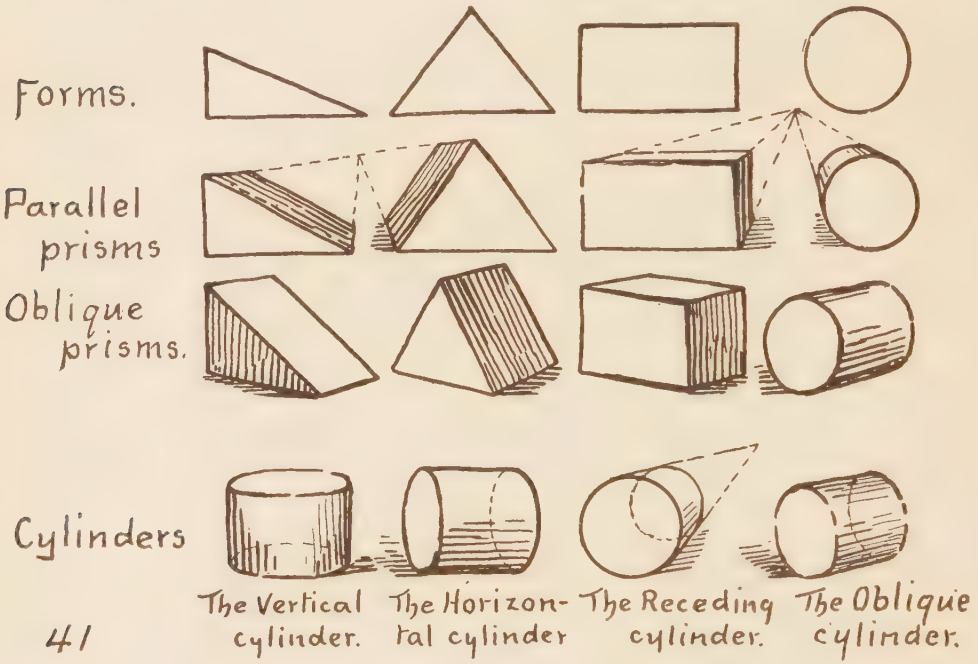
Draw the receding lines longer than they are to appear in the object, so as to judge more accurately of their correctness.

Fig. 39 represents the principal forms of the rectangular prism that may be used in drill work.

Learn to draw these forms quickly, with ease and a fair degree of accuracy.

The lunch box in Fig. 40 is an application of oblique drawing. All of the drawing in parallel perspective can be drawn in oblique perspective, and that may and should be the drill work in learning this branch.

Draw, for example, in oblique perspective the triangular prisms A, B and C, Fig. 36, and then draw their applications, as shown in D, E and F. Draw the houses in Fig. 37. Do this until this kind of drawing is learned.



41

THE CYLINDER.

With the addition of the cylinder, our measures of form are complete. The four rows of forms in Fig. 41 represent the mechanical basis of practically all form. These are the measures of form that underlie the arts and crafts, the engineering professions, and the great world of form. These are the basic forms for all making and building, and are common alike in the fashioning of delicate jewelry and the building of a great sky scraper.

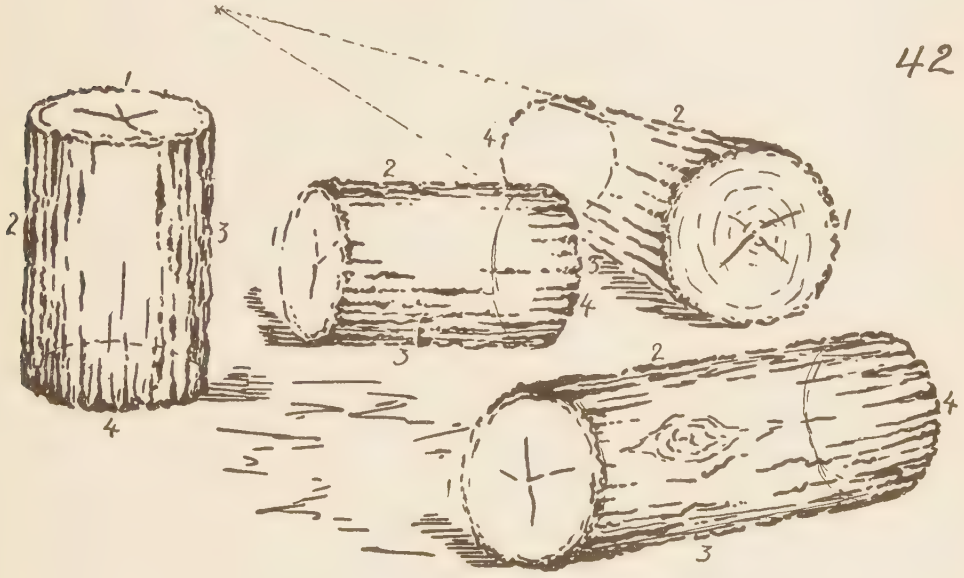
The cylinder is the measure of form for objects having curved lines. It is the mechanical basis of cylindrical shaped objects.

The leading directions of the cylinder are the vertical, the horizontal, the receding (horizontal receding), and the oblique (oblique horizontal receding). These four directions are the ones most commonly used in drawing cylindrical shaped objects; of these the first three are in parallel drawing and the last in oblique drawing.

These four cylinders must be thoroughly learned, learned to the extent that they can be easily, quickly and skillfully drawn. The test of knowing the cylinder is the ability to use it in drawing similar forms.

Models. Use a variety of models. A roll of pasteboard or paper two inches long, a small fruit can, a plain tumbler, and cylindrical blocks, are all good models. These models are not to draw from as in object drawing, but are to aid in understanding and learning the cylinder.

The cylinder and sphere are the last of the type forms. The cylinders, together with the rectangular and triangular prisms, are a complete set of measures for all forms. There are no more to learn.



The vertical and horizontal cylinders are drawn alike except in direction. The unseen end in each is drawn somewhat wider than the seen end. It is necessary to draw all of the unseen and to make correctly the part that can be seen. Draw the cylinder offhand and in the order of the numbers marked on the lines.

Draw the cylinder about two inches in diameter on paper, and about twelve inches on the blackboard. Mark in with light lines and finish with heavier.

The Receding Cylinder. The receding cylinder corresponds to the horizontal receding lines, hence the sides converge to the center of vision.

The center of vision is used when drawing this cylinder.

Both the seen and unseen ends are circles; both are alike, except in size.

It is at right angles with the picture plane.

The entire unseen end should be drawn.

The Oblique Cylinder. The oblique cylinder corresponds to the oblique, horizontal receding lines, hence the sides converge to a vanishing point.

The vanishing point is not used when drawing this cylinder.

Both the seen and unseen ends are ellipses; both are alike, except in size.

It is at an oblique angle with the picture plane.

The entire unseen end should be drawn.

These four cylinders must be thoroughly learned. They must be learned so well that they can be drawn easily, quickly and with a fair degree of accuracy. By learning these cylinders, the mechanical elements of all objects similar to a cylinder are being learned. It is well to draw these cylinders several times each day until learned.

Manual Training

ORIGIN AND INTRODUCTION.
1880 Washington University.
1882 Dwight School.
Sloyd System.
1903 National Educational Association.
1905 Committee Report.

PURPOSES.
To enable the child to enlarge his powers of expression.
To make him acquainted with the nature and use of the most common materials.
To lead him to develop a certain degree of skill in the use of tools.
To develop his originality.
To connect the work of school with the affairs of everyday life.

VALUE—Practical
It increases the pupil's power to do.
It gives a degree of skill in the use of tools.
It schools in the value of material.
It teaches the dignity of labor.

VALUE—Cultural.
It demands concentration of attention.
It requires organized thinking.
It demands an exercise of the will power.

DANGEROUS TENDENCY.

NEED OF TRAINED TEACHERS.

CORRELATED SUBJECTS.

BIBLIOGRAPHY.

QUESTIONS.

Is manual training instruction a regular feature in the school system of every large city?

Why did the committee not recommend the general introduction of such teaching in one-room schools?

Should such instruction be given only for its utility value?

Should teachers be selected from among artisans, or must they be professionally trained to be successful?

At what time in school work should manual training be introduced?

What department of the elementary schools are closely allied with manual training?

Does the instruction have a distinct industrial value for those who may earn a living by their hands?

What is the first essential of good citizenship?

Distinguish between technical education and manual training.

Sloyd was first introduced into the schools of what countries? Who extended the system?

Basketry

I. Woven Baskets.
   1. Form.
      a. Twill work.
      b. Wicker work.
      c. Checker work.
      d. Twined work.
   2. Material.
      a. Splints.
      b. Rods.
      c. Braid or bark.

II. Coiled Baskets.
   1. Style.
      a. Open work.
      b. Close or stitched.
   2. Material.
      a. Raffia.
      b. Rods.

QUESTIONS.

What people make baskets from raffia so small that they could be passed through a lady's finger ring, and others larger than a barrel?

What place has basketry among the mechanic arts?

In what ways do the American indians excel all other uncivilized tribes in this art?

The manufacture of baskets includes what?

Upon what does the labor and process depend?

What is the simplest form of woven basketry?

Of what does *twill* work consist?

Among the Rocky Mountain indian tribes what style is common?

How are *coiled baskets* made?

What is a striking feature of coiled baskets among the indians?

By what means does the basket-maker add to the grace and beauty of the basket?

Why has basketry been adopted for a portion of the industrial work in the schools?

What is raffia? What are textiles?

What style of basket-making is represented in Figure 5 in the illustrations?

Much as a man gains from actual conflict with living minds, he may gain much even of the same kind of knowledge, though different in detail, from the accumulated thinking of the past. No living generation can outweigh all the past. If books without experience in real life cannot develop a man all around, neither can life without books do it.

There is a certain dignity of culture which lives only in the atmosphere of libraries. There is a breadth and a genuineness of self-knowledge which one gets from the silent friendship of great authors without which the best work that is in a man cannot come out of him in large professional successes. —*Phelps.*

The value of a library depends not upon the number of its books but upon their character.
—*Carlyle.*

Geography

Geography was formerly considered to be a description of the earth's surface, but it is now considered as the science which treats of the earth as the home of man.

Since the relation of the earth to man is the central idea, the things immediately at hand should be studied first. In the outline submitted we begin with the school district, township, city and county. You, of course, would not expect to find in any general reference work local data to supply this information, but with the assistance of this Classified Topical Outline the information can be easily secured, and is of practical value.

Your own county and state have a geography more fascinating and interesting than any other country; yet our pupils, and not infrequently our teachers, know more of the jungles of AFRICA than of their own commonwealth.

These outlines covering local geography are followed by general outlines applicable to any city, any state and any country.

In addition to the general outline we are more specifically taking BOSTON as a city, CALIFORNIA as a state, and UNITED STATES as a country, and from the information which we furnish in THE NEW PRACTICAL REFERENCE LIBRARY, have developed model outlines which a student can adapt to his study of the various divisions and subdivisions.

It is not the aim of the editor to make this series of outlines exhaustive, but suggestive, and to furnish such models that the ambitious teacher and aspiring pupil can have suitable direction along the line of self-culture, which is the only practical education.

Geography in its true sense will bring before the student the products of the soil and the mill; the location of commercial highways; the effect of climate upon the productions and the peoples; the study of the natural resources which supply food and occupations of men; the reasons for the founding of cities at proper localities rather than elsewhere; the forms of government; the religion as practiced in the various countries, etc.

The study of geography in this way will give us the location of places, boundaries, etc., incidentally, and such information will become secondary and will be fixed in the mind permanently without a special study of same.

Physical, Mathematical, Political

Geography is divided into the great departments *Physical Geography* or *Physiography* (see *Physiography*), *Mathematical Geography*, *Political Geography*, which depends upon the other two divisions. Geography cannot be well taught without a thorough knowledge of the subject and a knowledge of correct methods of teaching. See *Geography, Methods of Teaching.*

Local Geography

I. School District.

1. Area.
2. Sections included.
3. Dimensions.
4. Bound by districts.
5. Census.
6. Population to square mile.
7. Per cent attending school.
8. Assessed valuation.
9. Per cent tax levy.
10. Cost of one year's schooling.
11. Who pays it?
12. Officers, duties, etc.
13. Map district—streams, houses, etc.
14. Historical.

II. Township.

1. Area.
2. Position.
3. Extent.
4. Bound by townships.
5. Congressional.
6. Municipal, civil.
7. Range.
8. Physical features.
    a. Streams, lakes, ponds.
    b. Forests, groves.
9. Advantages.
10. Improvements.
    a. Churches, schools, etc.
11. Township organization.
12. Officers.
13. Towns.
14. Old settlers.
15. Map.

III. City.

1. Class.
2. Charters.
3. Officers.
    a. Names.
    b. Duties.
    c. Terms.
    d. Salaries.
4. Levying and collecting taxes.
5. Administration of justice.
6. Police inspection.
7. Fire department.
8. Care of streets.
9. Sewerage.
10. Water supply.
11. Municipal ownership.
12. Municipal government.
13. Public parks, buildings, boulevards, etc.
14. Prisons.
15. Supervision of the liquor traffic.
16. Regulation of street railways.
17. Subways.
18. Building regulations.
19. Transportation.
20. Suburbs.
21. Supervision of charities.
22. Position and extent.
23. Commerce and industry.
24. History.
25. Population.

IV. County.

1. Define.
2. How change boundary.
3. Dimensions.
    a. Extent.
    b. Area.
4. Shape.
5. Boundaries.
6. Latitude.
7. Longitude.
8. Position in state.
9. Relief.
    a. Mean elevation.
    b. Highest elevation.
    c. Comparative elevation.
10. Population.
    a. Square miles.
    b. Increase in ten years.
    c. Per cent of increase.
    d. Rank.
11. Schools.
    a. Enumeration.
    b. Enrollment.
    c. Per cent enrollment of enumeration.
    d. Graded.
    e. District.
    f. Private.
    g. Number of districts.
12. Railroads.
    a. Steam and electric.
    b. Names.
    c. Miles.
13. Townships.
    a. Names.
    b. Number.
    c. Congressional.
    d. Municipal.
    e. Largest, smallest.
14. Range and township numbers explained.
15. County officers.
    a. Names.
    b. Duties.
    c. Terms.
    d. Salaries.
16. Streams.
17. Lakes and ponds.
18. Resources.
19. Towns, with population.
20. Metropolis.
21. County seat—why so called?
22. Highest building.
23. Public buildings and institutions.
24. Manufactures.
25. Newspapers.
26. Historical.
    a. When settled.
    b. When organized, etc.
27. Map—Use quadrille paper for beginners, counting each square one mile, or one-fourth mile, according to the size of your paper.

State Geography

I. Popular Names.
II. Location.
  1. Latitude and longitude.
  2. Position in the country.
  3. Boundaries.
III. Extent.
  1. Length.
  2. Breadth.
  3. Area.
IV. Size.
  1. Absolute.
  2. Relative.
V. Trend.
VI. Outline.
  1. Form.
  2. Regular or irregular.
VII. Coast Line.
  1. Length.
  2. Indentation.
  3. Projections.
VIII. Surface.
  1. General idea.
  2. Watersheds.
  3. Hills and mountains.
  4. Plains.
IX. Natural Curiosities.
X. Drainage.
  1. River systems.
  2. Special streams.
  3. Sources—lakes and springs.
XI. Climate.
  1. Causes.
  2. Healthfulness.
  3. Adaptation to industries.
  4. Compare with other localities.
XII. Industries.
XIII. Products.
  1. Agricultural.
    Crops.
    Domestic animals.
    Dairy, etc.
  2. Mineral. Fuel. Ores.
  3. Manufacturers.
XIV. People.
XV. Cities.
XVI. Internal Improvements.
XVII. Commerce.
  1. Railways and canals.
  2. Navigable rivers.
  3. Commercial centers.
XVIII. Government.
XIX. Civil Divisions.
XX. Education.
  1. Common schools.
  2. Higher institutions.
  3. Eleemosynary institutions
XXI. State Institutions.
XXII. Historical.
  1. Settlement.
  2. Admission.
  3. Places of historical interest
XXIII. Miscellaneous.

United States

I. Location.
II. Boundary.
III. Extent.
IV. Coastal Features.
V. Surface and Drainage. (See Relief Map.)
  1. The Atlantic Slope.
  2. The Appalachian Highlands
  3. The Great Plain.
  4. The Rocky Mountain Highlands.
  5. The Pacific Slope.
  6. Rivers.
  7. Lakes.
VI. Climate.
  1. Temperature.
  2. Rainfall. (Rain Map.)

Note.—Since thinking in images is easier for beginners than thinking in symbols, the instruction in geography should begin with child-life at home, with the things on the breakfast-table, with the garments worn and the means of transportation used, and proceed from these to the life, the home, the dress, and the sports of children living in other lands and other climes. The lessons in geography make constant appeals to the imagination, and call for thinking in images or mental-pictures in connection with map-symbols and the discussions of causes and laws. —*From Schaeffer's "Thinking and Learning To Think."*

VII. Mineral Resources.
- 1. Coal. (See Coal.)
- 2. Petroleum. (See Petroleum.)
- 3. Iron. (See Iron.)
- 4. Gold and silver. (See Gold; Silver.)
- 5. Other metals.
- 6. Building stones.

VIII. Vegetation.

IX. Animal Life.

X. Agriculture.
- 1. Cereals.
- 2. Cotton and tobacco.
- 3. Other crops.
- 4. Live stock.

XI. Fisheries.

XII. Manufactures.
- 1. Resources and causes of development.
- 2. Location of manufacturing districts.
- 3. Leading industries.
  - a. Iron and steel.
  - b. Textiles.
  - c. Leather.
- 4. Other industries.

XIII. Transportation and Communication.
- 1. Waterways.
- 2. Railroads.
- 3. Roads.
- 4. Communication.

XIV. Commerce.
- 1. Domestic commerce.
- 2. Foreign commerce.

XV. Population.
- 1. Increase in population. (Table.)
- 2. Movement westward. (Map.)
- 3. Density. (Map.)
- 4. Growth of cities.
- 5. Immigration.
- 6. Color.
- 7. Present character.

XVI. Government.
- 1. General character.
- 2. Legislative department.
- 3. Executive department.
- 4. Judicial department.
- 5. Colonial possessions.
- 6. State government.
- 7. Territories.
- 8. Finance.

XVII. Political Divisions.
(See Table.) (This table gives the name of the state, its popular name, area, date of admission into the Union, population, colored population, and number of representatives in congress.)

XVIII. Education.

XIX. Literature.

XX. Art.

XXI. Cities. (Table.)

XXII. History.
- 1. Discovery and exploration.
- 2. Colonization.
- 3. Colonial development.
- 4. Development of Union.
- 5. Revolutionary War.
- 6. Articles of Confederation.
- 7. Organization of the national government.
- 8. Supremacy of the Anti-Federalists.
- 9. The era of good feeling.
- 10. John Quincy Adams.
- 11. Democracy again in power.
- 12. Texas and the Mexican War.
- 13. Downfall of the Whigs.
- 14. Slavery.
- 15. Civil War.
- 16. Reconstruction.
- 17. Industrial progress and problems.
- 18. Financial panic of 1893.
- 19. Expansion. (Table.)
- 20. Recent progress.
- 21. Bibliography.

Note.—In the great journal of things happening under the sun we, the American people, find ourselves in the peaceful possession of the fairest portion of the earth as regards extent of territory, fertility of soil and salubrity of climate.

—*Abraham Lincoln.*

Compare the areas of New York and Minnesota.

California is how many times the size of New Jersey?

Why is the Hudson of more importance to commerce than the Colorado?

What interferes with navigation on the Missouri River?

How does the Mississippi compare in length with the Volga?

Which has the greater volume of water, the Mississippi or the Amazon?

What river is of the oldest historic importance?

What are the Palisades of the Hudson?

Where are the natural bridges?

What bodies of water would you pass through in going from Superior to New York City?

What is the area of Yellowstone National Park?

What commercial advantages has Chicago?

How does the United States compare in size with Australia?

What principal cities would you pass in going by boat from St. Paul to New Orleans?

What bodies of water would you pass through in going from New York to Yokohama by way of Suez Canal?

How many cities has the United States with a population over 1,000,000? Over 500,000? Over 100,000? Name several.

When was your state admitted into the Union?

By the last census how many negroes resided in your state?

How many representatives are sent to congress by your state? What must be the increase in population before another can be added to the list?

By referring to the product map in article on United States, what states do you say constitute the spring wheat belt? The cotton group? The live stock territory? The wool regions? The fruit sections? Give reasons for your answer.

Where was the center of population of the United States in 1800? In 1850? In 1870? In 1900? (See outline map in article on United States.) How has the center of population traveled? Has it fluctuated much from north to south? What is remarkable about its progress?

Assuming the center of population will travel westward at the rate it has since 1860, where will it be in 1930? When will it reach Missouri? When Kansas, within whose borders is the geographical center of the country?

What was the percentage of increase in population of the United States from 1800 to 1810? From 1890 to 1900? Is the percentage increasing or decreasing?

While the size of California and Japan is approximately the same, how do they compare in population?

What state is popularly known as the Blue Grass State? Nutmeg State? Diamond State? Equality State? Sage Brush State? Flickertail State? What is the popular name of your own state?

What would be the population of Texas if as thickly settled as Rhode Island? How many Rhode Islands could be carved from Texas? How many from Pennsylvania? From Iowa? From California?

From observation of the map, what state is bounded on the north and east by the Mason and Dixon's line?

Which is farther north, St. Paul, Minn., or Augusta, Me.?

Which is farther south, San Antonio, Texas, or Tampa, Florida?

What are the abbreviations (which see) of the following: Louisiana, Maryland, Utah, Oklahoma, Long Island, Alaska?

Alabama

"The Cotton State."

Location.
1. Latitude.
2. Longitude.
3. Position in the United States.
4. Boundaries.

Extent.
1. Length.
2. Breadth.
3. Area.
4. Shape.
5. Relative size.

Surface.
1. Lowlands.
2. Highlands.
   Mountains.
   Hills.
   Slopes.

Drainage.
1. Water Shed.
2. River Systems.
3. Rivers.

Population.
1. Total.
2. To the Square Mile.
3. Rank.

Climate.
1. Characteristics.
2. Rainfall.
3. Healthfulness.

Resources.
1. Mineral.
2. Agricultural.
3. Mining.
4. Manufacturing.
5. Quarrying.

Cities.

Government.

Education.
1. Common Schools.
2. State Institutions.
3. Other Institutions.

History.
1. Discovery.
2. First Settlement.
3. Ceded to the U. S.
4. Admitted to the Union.
5. Part in the Civil War.

QUESTIONS.

What is Alabama's rank in the production of cotton?

What is the leading city of the state? What has caused this city's recent growth?

What portions of Alabama are frequented as winter resorts?

In what part of the state is iron found?

Has the state any other minerals of importance? If so, name them.

What interesting historical event occurred in Mobile Bay?

What rivers form part of the boundary between Alabama and Florida?

What portions of the state are mountainous?

What river forms part of the eastern boundary?

What important city on Mobile Bay?

What are the two most important railway centers in the state?

What is the character of the surface in the southern part of the state?

What rivers flow in Mobile Bay?

What is the largest river in the state?

In what locality are the highest mountains found?

How does Alabama compare with Georgia in area and population?

California

HISTORY.
Spanish Explorations.
(a) Cabrillo
(b) Drake
Mexican territory admitted as a State?

AGRICULTURE.
Grains
Fruits
(a) Oranges
(b) Prunes
(c) Grapes
(d) Nuts
(1) Almonds
(2) Walnuts
Vegetables

CITIES.
Sacramento
San Francisco
Los Angeles
Oakland
San Jose
Stockton

EDUCATION.
Public schools
High schools
Normals
Universities
State institutions

SURFACE.
Mountains
Rivers
Valleys
Lakes
Plains

MANUFACTURES.
Shipbuilding
Sugar refineries
Olive oil
Lumber
Canning

TRANSPORTATION.
Railways.
(a) Steam
(b) Electric
Commerce.
(a) Rivers
(b) Ocean
(c) Harbors

CLIMATE.
Ocean currents
Winds
Altitude
Rainfall
Latitude

TEST QUESTIONS ON CALIFORNIA.

What white explorers visited California almost a hundred years before the settlement of Jamestown?

From what does California take its name? What was its first name?

How does the length of California compare with the distance from Indianapolis to New York City?

How many Rhode Islands could be carved from the State? How many New Yorks? Ohios?

How does California rank in size with Texas? With Massachusetts? With Norway?

What would be California's population if as thickly settled as Massachusetts?

Which has the larger population California or Chicago?

What city in California doubled its population between 1890 and 1900?

How does San Francisco compare in population with Baltimore? St. Louis? New Orleans?

How does the output of the gold mines compare in value with the fruit industry?

Name five of the leading fruits of California found in your grocery store?

How many thousand carloads of oranges are produced every year?

What natural advantages has California for foreign trade?

What distinguishes the public school system of California?

In what year did the first American emigrant wagon reach the State?

At the breaking out of what war was California declared a republic?

When and by what treaty was it ceded to the United States?

What discovery led to an influx of settlers from all parts of the world?

When was California admitted to the Union?

Why is the climate of California entirely different from the eastern states in the same latitude?

Explain why the same fruits grow in the northern part as in the southern?

To what is the mildness of the climate due? How is the year divided as to seasons?

What is the state flower?

From a study of the color plate, what do you judge to be the leading industries?

1, State Flower.
2, Peaches.
3, Pears.
4, Grapes.
5, Plums.
6, Apricots.
7, Almonds.
8, Apples.
9, Orange Tree.
10, Ostriches.
11, Olives.
12, Palm Tree.
13, Branch of Lemon Tree.
14, Figs.
15, Vegetables.
16, Hydraulic Mining.
17, Big Tree.
18, Mount Shasta.
19, California Roses.

San Francisco

HISTORY.
- Mission established.
- Sudden growth.
- Prominence.
- Earthquake.
  - Fire.
  - Loss.
- Reconstruction.

DESCRIPTION.
- Situation.
- Size.
- Rank.
- Population.
  - Character.

COMMERCE AND INDUSTRY.
- Harbor.
- Foreign trade.
  - Value.
- Railroad ferries.
- Commission business.
- Manufactures.
  - Importance.
- Shipbuilding.

SITUATION.
- Hills.
- Residence section.
- Sand dunes.
- Business portion.

ITEMS OF INTEREST.

San Francisco is called the "Queen City of the Pacific Slope."

The United States mint in San Francisco was established in 1854.

San Francisco has the only natural harbor between Astoria on the north and San Diego on the south.

San Francisco is one of the principal cities of the Pacific coast, and its industries, wealth and fine buildings rival those in the east.

Perhaps the most interesting part of the city before the earthquake was the portion known as "Chinatown," where thousands of Chinese are crowded together, living in the same manner as they did at home. Special guides are needed to visit this part of the city, as there are many gambling houses and opium dens.

San Francisco is one of the most remarkable examples of rapid growth on record.

QUESTIONS.

How does this city rank in population with other cities in the U. S.?

On what is it situated? What does it comprise?

What is meant by the "Golden Gate"?

What gives this city its picturesque appearance?

What are the sand dunes? Of what benefit are they?

What part of the city is called the Mission? For what is it named?

How is the city divided? What are the divisions called and what do they comprise?

What is the most beautiful park found in this city? How does it rank with other parks in the world?

For what are the "Seal Rocks" noted?

What libraries were destroyed by the fire of 1906?

How does this city rank as a seaport? What is the value of her foreign trade?

What railroad facilities has this city? What connection with trans-continental railroad lines?

How did San Francisco get its name? What caused its sudden prominence?

What disaster occurred in 1906? Which caused the most damage, the earthquake or the fire which followed?

What precaution has been taken to eliminate all possibility of another such fire?

How does the population of this city resemble that of Chicago? New York?

Colorado

I. Popular Name.
II. Location.
  1. Latitude.
  2. Longitude.
  3. Position in U. S.
  4. Boundaries.
III. Extent.
  1. Length.
  2. Breadth.
  3. Shape.
  4. Area.
IV. Size.
  1. Absolute.
  2. Relative.
V. Population.
  1. Total.
  2. To square mile.
  3. Rank.
VI. Surface.
  1. Plains.
  2. Mountains.
    a. Ranges.
    b. Peaks.
  3. Water Shed.
VII. Drainage.
  1. Systems.
  2. Streams.
  3. Sources.
VIII. Climate.
  1. Causes.
  2. Varieties.
  3. Characteristics.
  4. Rainfall.
  5. Healthfulness.
IX. Resources and Products.
  1. Mineral.
  2. Agricultural.
    a. Irrigation.
    b. Crops.
    c. Grazing.
  3. Lumbering.
  4. Manufacturing.
  5. Transportation.
X. Education.
  1. Permanent Fund.
  2. Common Schools.
  3. State Institutions.
XI. Cities.
  1. Important ones.
  2. (Study your local town using our outline on Local Geography.)
XII. History.
  1. Meaning of name.
  2. Early explorations.
  3. How secured by U. S?
  4. Pike and Fremont.
  5. Discovery of gold.
  6. Admission.
  7. Woman suffrage.
XIII. Items of Interest.
  1. Garden of the Gods.
  2. Royal Gorge.
  3. Pike's Peak.
  4. Monument Park.
  5. Hot Springs.
  6. Beautiful Canyons.

INTERESTING FACTS.

Colorado is noted for a highly developed system of irrigation.

Colorado has the greatest game preserves in America.

Colorado contains the richest and most productive gold and silver mines in the world.

Colorado is a land of sunshine, three hundred and fourteen days of the year being clear in whole or in part.

It is larger than all New England States combined, with the State of Ohio added; it is larger than the four Middle States, and larger than England, Scotland and Wales combined.

In addition to and accompanying the irrigation development, what is known as the "Dry Farming" movement is making rapid progress in Colorado. The dry farming method of agriculture, sometimes known as the "Campbell System," consists of scientific methods of culture by which the moisture is conserved in the soil itself, instead of by means of reservoirs and ditches, and is adapted to lands where irrigation is not possible.

COLORADO

"CENTENNIAL STATE"

PIKE'S PEAK.

ROYAL GORGE

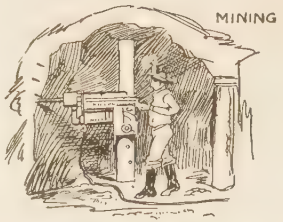
CLIFF PALACE

COLUMBINE
State Flower

MELONS

FAMOUS MINING CAMPS

LEADVILLE
CRIPPLE CREEK
CREED
CANYON CITY
VICTOR



MINING

ON THE PLAINS.

TEST QUESTIONS ON COLORADO.

From what does Colorado take its name? What does it signify?

What is the general shape of this State?

How does the length of Colorado compare with the distance across the continent? How does its breadth compare with the breadth of the United States?

It is called the Centennial State because it was admitted 100 years after American Independence. In what year was that?

What proportion of the State's population is included in its largest city?

What would be Colorado's population if as thickly settled as Rhode Island?

Have any states bordering Colorado a greater area than Colorado?

What other states in the United States have a greater area?

How does Colorado compare in area with Texas? Germany? Norway?

Colorado is equal in area to how many 160-acre farms?

What are the results of its numerous spurs and cross ranges of mountains?

How many peaks over 14,000 feet high in this State?

Where does the Great Continental Divide cross the State? What effect does it have upon the rivers?

What are the characteristics of Colorado climate? What is the cause for the varied climate? How do you explain the fact that the temperature seems to differ from that indicated by the thermometer?

What is the average rainfall? Is this enough to produce crops?

How does the value of the yearly output of beet sugar compare with the amount of gold produced?

The value of the gold output constitutes what proportion of the mineral wealth?

At what price per ton would it be necessary to sell the output of coal to equal in value the annual production of gold?

Locate the following places on the sketch map and tell for what each is noted: Denver. Pueblo. Leadville. Colorado Springs.

What is the value of the sugar beet industry? How many tons of beets are raised to the acre?

How many acres under cultivation? What proportion of the entire area?

Name six important agricultural products.

What is said of the growth of apples and other fruits?

Name some of its trees valuable for lumber.

What is said of grazing?

How many miles of railroads in Colorado? What was the first line built? Name three of the most important lines.

What constitutes a permanent school fund? Where is the State University located? The School of Mines? The State Normal School? The Agricultural College?

In what century was Colorado first visited? By whom?

When was the State Capitol completed? At what cost?

Does any other state produce more gold than Colorado? More silver?

In what way does suffrage in this State differ from eastern states?

This State casts its electoral vote for which of the political parties?

What forms the gateway to the Garden of the Gods?

What is said of the canyons?

What is the State flower of Colorado?

What is the depth of the Royal Gorge? What is said of its picturesqueness?

How are tourists taken to the summit of Pike's Peak? How does the height of Washington's Monument compare with that of Pike's Peak?

Atlanta

THE GATE CITY.

SITUATION.
- In United States.
- In state.

DESCRIPTION.
- Size.
- Population.
- Area.
- Plan.

PARKS.
- Grant.
- Piedmont.

PROMINENT BUILDINGS.
- Capitol.
- Public buildings.
- Educational institutions.
- Libraries.
- Business blocks.

COMMERCE AND INDUSTRY.
- Facilities.
- Trade.
- Water power.
- Manufactures.

HISTORY.
- First home.
- Incorporation.
- Original name.
- Civil war.
- Capital.
- Cotton Exposition.

INTERESTING ITEMS.

Atlanta is called "The Chicago of the South."

Atlanta was settled in 1836. It became capital of Georgia in 1877.

This city was destroyed by fire in 1864, but was rebuilt on a finer and larger scale and has steadily increased in size and wealth since that time.

The original name of this city was Marthasville and was changed to its present name in 1845.

The Cotton Exposition, held in 1895 in this city, far outranked anything of this character ever held before and in some ways rivalled the World's Fair, $2,000,000 being expended on the buildings, etc.

The city has an excellent system of public schools, as well as a large number of institutions of higher education as listed in The New Practical Reference Library.

QUESTIONS.

In what way does Atlanta differ from most southern cities?

How does this city's location affect her commerce? Of what does the trade principally consist?

What railroads enter this city? How does Atlanta rank among southern cities as a railroad center?

How is this city laid out? What proportion of its streets are paved?

When was this city made the capital? Describe the Capitol building.

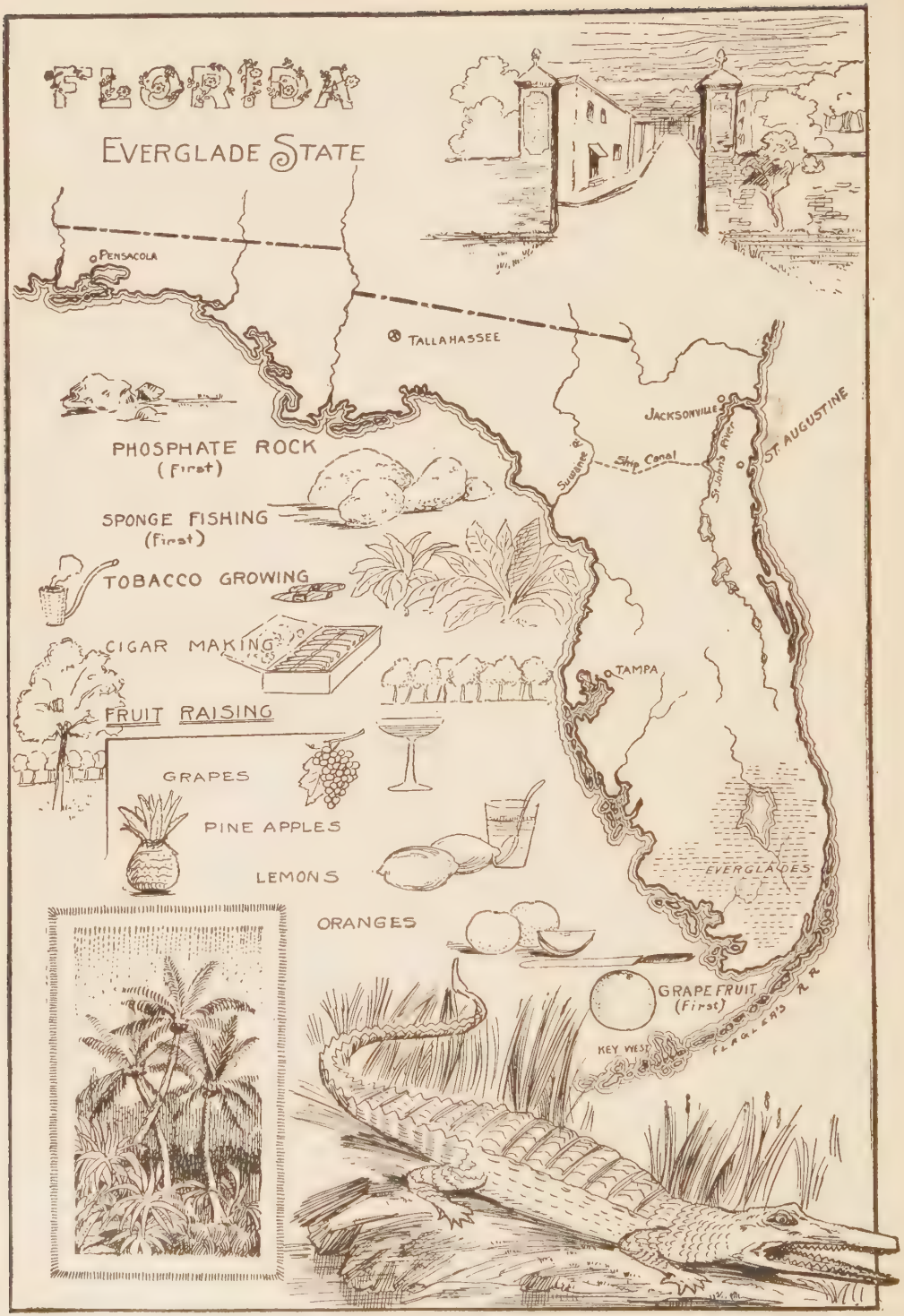
What natural advantage has helped the growth of industrial plants in this city?

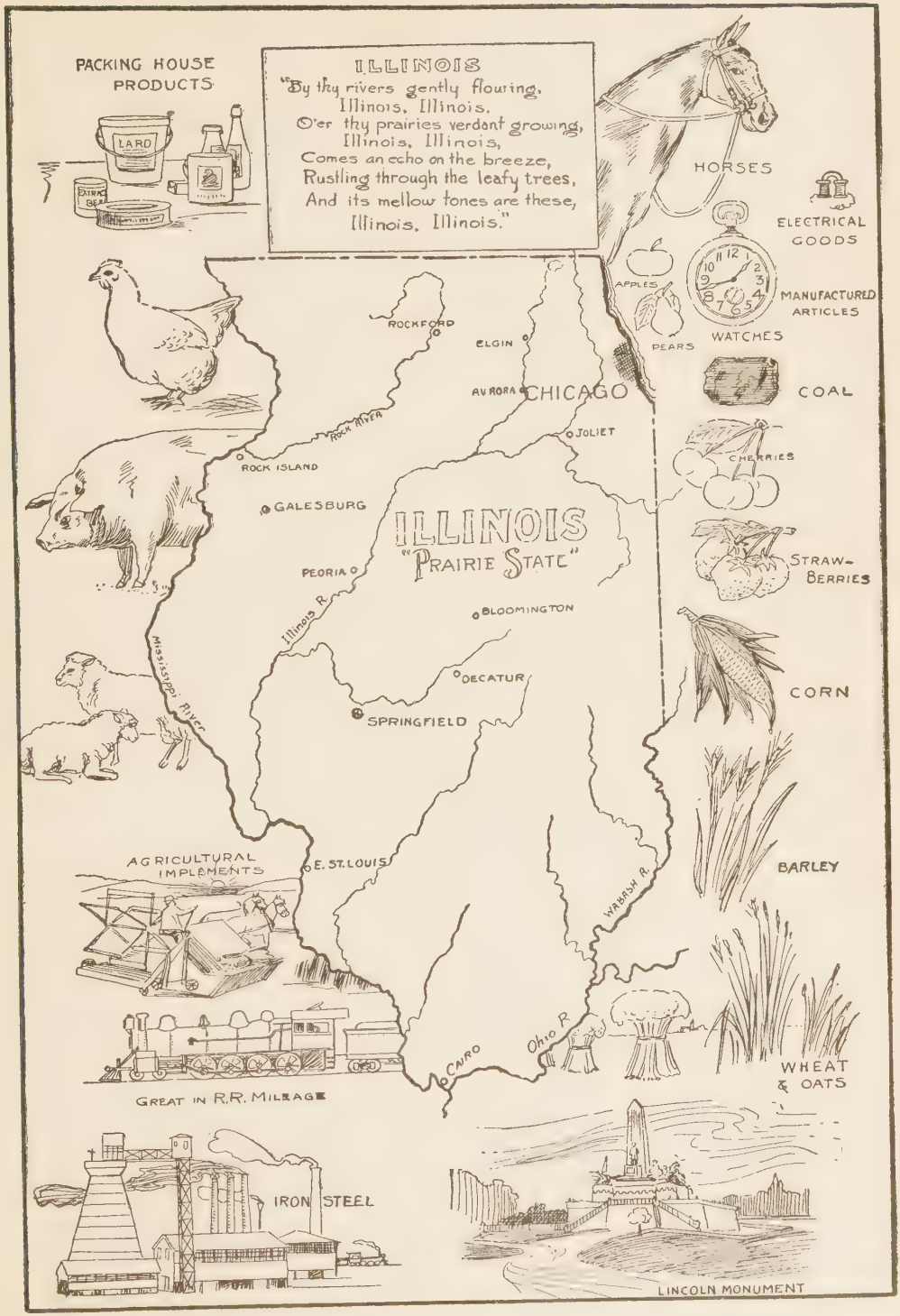
What are the principal articles manufactured?

At what time was this city almost destroyed? What improvements have been made in its rebuilding?

When and by whom was this city captured during the Civil war?

How does Atlanta compare in population and area with New Orleans, Memphis, Norfolk?


FLORIDA
EVERGLADE STATE
PENSACOLA
TALLAHASSEE
JACKSONVILLE
ST. AUGUSTINE
St. Johns River
Ship Canal
Suwanee R.
PHOSPHATE ROCK
(First)
SPONGE FISHING
(First)
TOBACCO GROWING
CIGAR MAKING
TAMPA
FRUIT RAISING
GRAPES
PINE APPLES
LEMONS
ORANGES
EVERGLADES
GRAPE FRUIT
(First)
KEY WEST
FLAGLER'S R.R.


ILLINOIS
"By thy rivers gently flowing,
Illinois, Illinois,
O'er thy prairies verdant growing,
Illinois, Illinois,
Comes an echo on the breeze,
Rustling through the leafy trees,
And its mellow tones are these,
Illinois, Illinois."
PACKING HOUSE PRODUCTS
LARD
EXTRACT BEEF
HORSES
ELECTRICAL GOODS
APPLES
PEARS
WATCHES
MANUFACTURED ARTICLES
COAL
CHERRIES
STRAW-BERRIES
CORN
BARLEY
WHEAT & OATS
ROCKFORD
ELGIN
AURORA
CHICAGO
JOLIET
ROCK RIVER
ROCK ISLAND
GALESBURG
ILLINOIS
"PRAIRIE STATE"
PEORIA
ILLINOIS R.
BLOOMINGTON
DECATUR
SPRINGFIELD
MISSISSIPPI RIVER
AGRICULTURAL IMPLEMENTS
E. ST. LOUIS
WABASH R.
CAIRO
OHIO R.
GREAT IN R.R. MILEAGE
IRON STEEL
LINCOLN MONUMENT

Illinois

"The Prairie State."

I. Popular Name.
II. Position.
  1. Latitude.
  2. Longitude.
  3. Boundaries.
    (a) Natural.
    (b) Artificial.
III. Outline.
  1. Regular.
  2. Irregular.
IV. Extent.
  1. Definite.
  2. Comparative.
  3. Length and breadth.
  4. Area.
V. Surface.
  1. General character.
    (a) Plains.
    (b) Hills.
    (c) Slope.
VI. Map.
  1. Map study.
  2. Memory sketches.
VII. Drainage.
  1. Lakes.
  2. Canals.
  3. Rivers.
    (a) Systems.
    (b) Principal streams.
    (c) Length.
    (d) Tributaries.
VIII. Climate.
  1. Climatic range.
  2. Causes.
  3. Healthfulness.
  4. Rainfall.
IX. Resources and Industries.
  1. Minerals.
    (a) Building materials.
    (b) Mines.
    (c) Oil wells.
  2. Agriculture.
    (a) Soil.
    (b) Variety of crops.
    (c) Domestic animals.
  3. Manufacturing.
    (a) Articles produced.
    (b) Kind and value.
  4. Meat packing.
  5. Mining.
X. Commerce.
  1. Navigable rivers.
  2. Canals and lakes.
  3. Railways.
  4. Commercial centers.
XI. Education.
  1. Public schools.
    (a) Permanent fund.
    (b) Number of pupils.
    (c) Annual expense.
  2. Higher institutions.
    (a) Universities and colleges.
    (b) Normal schools.
XII. Population.
  1. Total.
  2. Rank.
  3. Increase.
XIII. Cities.
  1. Important ones.
  2. Capital.
  3. Metropolis.
XIV. History.
  1. Settlement.
  2. Indian wars.
  3. Territorial.
  4. Early capitals.
  5. Admission.
  6. Distinguished men.
  7. Later events.

ITEMS OF INTEREST.

The County of Illinois was formed in 1779 with Patrick Henry as first governor.

In 1816 Indians granted a strip of land for the construction of a canal and the Illinois and Michigan Canal was opened in 1848.

The first discovery of coal in America, of which there is any printed account, was made by Father Hennepin in Illinois and was mentioned in Hennepin's journal in 1698 as being near where Ottawa now stands.

The name "Suckers," sometimes applied to the people of Illinois, originated in the early days from the fact that people when traveling in the dry season, when there was no water to be found, by thrusting long hollow reeds into the holes made in the ground by the crawfish, secured a supply of water.

Illinois holds first rank as a producer of corn.
This state stands first among the states in number of horses raised.
The arsenal at Rock Island is the most completely appointed in America.
The Union Stock Yards in Chicago are the largest in the world.
Elgin has one of the largest watch factories in the United States.
The largest zinc works in America are located at La Salle.
Springfield is known as the "Flower City."
Quincy is known as the "Gem City"; Bloomington as the "Evergreen City."
The Illinois Central Railroad was granted by the State a strip of land 7½ miles each side of its track and received every alternate section of land. In return for this the State receives 7% of the railroad's gross earnings.
Illinois ranks second in the production of oats, coal, swine and glass sand.
In value of mineral products, Illinois ranks second.

QUESTIONS ON ILLINOIS.

What is the general outline of this state?
How does its length compare with its width?
What forms its boundaries?
What proportion of the area of Illinois is water?
In what way does the northern part differ from the southern part?
What are the general characteristics of Illinois' climate? What causes the difference in climate?
What is the average rainfall? Where is it heaviest?
What is the most important mineral? Where is it found?
What area of Illinois contains coal? How does it compare with the rest of the state? What is the annual output?
Name other minerals found. In what counties are they found?
Name some important agricultural products.
How does Illinois rank in production of corn?
How does the annual production of corn compare with the annual output of coal?
What percentage of this state's manufactures are produced in its largest city?
What two states exceed Illinois in the extent of their manufacture?
For what are the following cities noted: Chicago, Peoria, Elgin, Moline?
Name three important railroads.
What are some of the important river ports?
Where is the Illinois and Michigan Canal? What does it connect?
What and where is the Drainage Canal? How does it affect Chicago?
What do you know of the livestock of this state?
What is at the head of the school system of the state? From what is the support of the schools derived?
Name some of the Universities in Illinois.
How does the population of Illinois compare with that of New York? Of Mexico?
Name some of the state institutions and where located.
When was Illinois first settled? By whom?
When did the United States acquire this territory?
What part did Illinois play in the Mexican and Civil Wars?
Name some prominent men of Illinois. How were they distinguished?
Name three important events in the history of Illinois since the Civil War.
What are some of the reasons for Illinois' rapid growth?
What are some of its important industries? Where are they conducted?
How does Illinois rank with other states in mining? Agriculture? Meat-packing? Manufacturing?

The following outline is one which a local class can prepare on the industries of their own state.

Illinois

1. Agriculture.
   - Crops raised.
   - Uses.
   - Where raised?
   - Where sent?
2. Stock Raising.
   - Animals raised.
   - Food.
   - Use.
   - Where shipped?
3. Meat Packing.
   - Where carried on?
   - Kinds of animals.
   - Methods of killing.
   - How shipped?
4. Manufacturing.
   - Location of plants.
   - Articles manufactured.
   - Uses.
   - Where shipped?
5. Mining.
   - Where carried on?
   - Minerals mined.
   - Quantities.
   - Use.

Chicago

"The Garden City."

Description.
- Location.
- Population.
- Size.
- Divisions.
- Business district.
- Residence portions.
- Streets.
  - Direction.
  - Regularity.

Waters.
- River.
  - Location.
  - Direction of flow.
  - Branches.
- Lake Michigan.
  - Water supply.
  - Tunnels.
  - Cribs.
- Chicago Drainage Canal.

Parks and Boulevards.
- Park system.
  - Management.
- Largest parks.
  - Lincoln.
  - Jackson.
- Boulevards.
  - Completeness.
  - Extent.
  - Important ones.

Transportation.
- Electric.
- Elevated.
- Steam
- Mileage.

Commerce.
- Extent.
- Value.
- Lake traffic.
- Inland port.
- Commercial center.
- Railroad center.

Industry.
- Industrial center.
- Live stock market.
  - Slaughtering.
  - Meatpacking.
- Manufacturing.
  - Number.
  - Foundries.
  - Agricultural implements.
- Stores.
  - Wholesale.
  - Retail.
  - Extent.
  - Importance.

Prominent Buildings.
- Federal building.
- County building.

City hall.
Libraries.
Number.
Size.
Art Institute.
Theaters.
Churches.
Field Museum.
Board of Trade.
EDUCATION.
Number of schools.
System.
Universities.
Institutions.
Settlement houses.
Schools of art and music.
HISTORY.
Early settlers.
Fort Dearborn.
Great Fire.
Later events.
Progress.
Growth.

ITEMS OF INTEREST.

The boulevard system of Chicago is noted for its extent and completeness.
The library of the University of Chicago is the most valuable in the city.
Chicago is the industrial and commercial center of the west.
It is the greatest railroad center and live stock market in the world.
The stock yards contain the largest meat-packing houses in the world.
Chicago is noted for its immense retail stores, Marshall Field & Co.'s store being the largest in the world.
Chicago ranks second in the United States in extent and value of its commerce.
No other large city in the world has increased in population and wealth as rapidly as Chicago.
Chicago is the greatest grain market in the world.
In size and population this city ranks second in the United States.

QUESTIONS.

How does Chicago compare in size and population with London? Paris? New York?

What causes the divisions in this city and what are the divisions called?

How does the mileage of the surface lines compare with that of the elevated roads?

What percentage of the total population of this city travels daily over its transportation lines?

How does the drainage canal affect the drainage of Chicago?

From where is the water supply obtained? How is it procured?

How does Chicago's location favor its manufactures?

How many workmen are employed in its factories?

What is the most important industry? Where is it carried on?

How does Chicago rank in extent and value of its commerce?

When was Chicago first visited? By whom?

What well-known fort was erected at Chicago? In what year? When was it evacuated? Why?

What great disaster occurred in this city in 1871? What was the loss?

Name three important events which have taken place in Chicago since the great fire.

What progress has been made in late years?

Indiana

"The Hoosier State."

- Location.
  - Position.
  - Boundaries.
- Surface.
  - Divisions.
  - Characteristics.
  - Hills.
  - Plains.
  - Marshes.
  - Caves.
- Climate.
  - Difference.
  - Cause.
  - Rainfall.
  - Snowfall.
- Resources.
  - Fertile soil.
  - Natural gas.
  - Bituminous coal.
  - Oil fields.
  - Clays.
  - Limestone.
- Rivers.
  - Systems.
  - Principal ones.
  - Areas drained.
  - Underground streams.
- Cities.
  - Capital.
  - Trade centers.
- Agriculture.
  - Grains.
  - Fruits.
  - Grazing.
- Manufacturing.
  - Factories.
  - Foundries.
  - Mills.
  - Distilleries.
  - Quarries.
- History.
  - Explorers.
  - Settlement.
  - Territorial.
  - Admission.
  - Progress.

INTERESTING ITEMS.

The Epsom Salt Cave in Indiana contains Epsom salt, sometimes in lumps of ten pounds weight, which entirely covers the floor of the cave.

The Lost River in Orange County runs underground for a distance of eleven miles.

The glass works in New Albany are the largest of the kind in America.

Richmond is called the "Quaker City of the West."

On the Kankakee River are extensive cranberry marshes.

Michigan City and Gary are the only lake ports in Indiana.

The first settlement in Indiana was made at Vincennes in 1702.

Delphi is noted for its lime manufactures.

Indiana excels all other states in the manufacture of plate glass.

Indianapolis is the largest city in the United States not situated on navigable water.

Hamer's Cave is about two miles east of Mitchell, and the floor is covered with a swift stream of water varying in depth from eight inches to about twenty feet. Few people explore this cave, as a boat must be used to do so.

Indiana is noted for the number of literary people which it has produced.

QUESTIONS ON INDIANA.

What is the general outline of this state?

How does its area compare with that of New Mexico? Colorado?

How is the surface divided? How does the surface vary in these regions?

In what region are the underground streams found?

What and where is Wyandotte Cave?

What is meant by "Dunes"? Where are they found?

What are some of the principal rivers? What territory does each drain?

What causes the difference in temperature?

Where is the heaviest snowfall? Where the heaviest rainfall?

Where are the coal fields situated? What kind and of what use is the coal?

Where is the natural gas field? What area does it cover?

In what part of the state is the oil field?

What building materials are found?

What is the leading industry?

IOWA

The Hawkeye State

HISTORY

VISITED BY MARQUETTE AND JOLIET IN 1673
FIRST SETTLEMENT IN 1783
ORGANIZED AS A TERRITORY IN 1838
ADMITTED TO THE UNION IN 1846

GEOGRAPHY

AREA 56,025 SQUARE MILES
EQUAL TO 7/8 OF MASSACHUSETTS
AVERAGE LENGTH FROM EAST TO WEST, 300 MILES
LENGTH FROM NORTH TO SOUTH 200 MILES

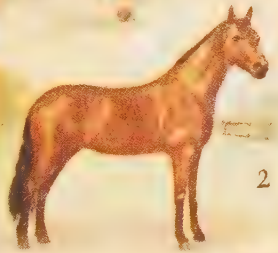
INDUSTRIES

DAIRYING
RAISING LIVE STOCK
AGRICULTURE

EDUCATION

PUBLIC SCHOOL SYSTEM SECOND TO NONE
HIGHER INSTITUTIONS
UNIVERSITY OF IOWA
TEACHERS' COLLEGE
STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS

1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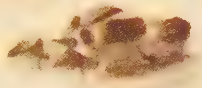
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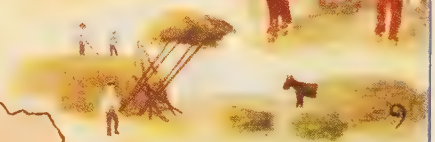
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10

1, Swine.
2, Horse.
3, Coal.
4, Cornfield.
5, Creamery.
6, Harvesting Oats.
7, Milch Cows.
8, Limestone.
9, Haying.
10, Young Shorthorns.

What are the chief crops raised?
What natural facilities have aided Indiana in its manufactures?
What are some of the most important manufactures?
What railroad facilities has this state? What is its mileage?
What rivers afford transportation?
Name some of the most important cities.
When was the first permanent white settlement made? Where?
To what countries did Indiana belong?
When and how did it become a possession of the United States?
What other states were included in the territory of this state? When was it reduced to its present size?
How long has Indiana been a state?
What progress has it made?

Iowa

"The Hawkeye State."

Location.
- Latitude.
- Longitude.
- Position.

Boundaries.
- Natural.
- Artificial.

Outline.
- Regular.

Extent.
- Length.
- Breadth.
- Area.
- Comparative.

Population.
- Total.
- Square mile.
- Comparative.

Surface.
- Prairie.
- Swells.
- Valleys.
- Slopes.
- Altitudes.
- Hills.

Drainage.
- Rivers.
  - Systems.
  - Largest.
- Lakes.
  - Names.
  - Beauty.

Climate.
- Varieties.
- Characteristics.
- Snowfall.
- Atmosphere.
- Healthfulness.
- Rainfall.

Mineral Resources.
- Products.
- Quality.
- Supply.

Agriculture.
- Per cent of farms.
- Products.
  - Cereals.
  - Grasses.
  - Fruits.
  - Stock.
  - Dairy.

Manufacturing.
- Extent.
- Kinds.

Transportation.
- Waters.
- Railroads.

Commerce.
- Extent.
- Imports.
- Exports.

Education.
- Illiteracy.
- Public schools.
- Higher institutions.

Eleemosynary Institutions.
- Names.
- Locations.

Cities.
- Names.
- Characteristics.
- Unique feature.

History.
- Original inhabitants.
- Marquette and Joliet.
- First settlement.
- Louisiana Purchase.
- Territorial organization.
- Admission.
- Prominent questions.
- Advanced legislation.

ITEMS OF INTEREST.

Iowa is a leading agricultural state in the Union.

Dubuque, which is the oldest town in the state, is known as the "Key City."

Iowa produces more oats than any other state.

On the Iowa River, near Decorah, is a natural ice cave which contains a cavern the interior of which is a mass of ice. This cave was used in early times by the Indians for preserving game.

Iowa ranks twenty-second in size.

This state is second only to New York in number of milch cows.

The highest point of land in this state is located near Spirit lake.

Iowa is the only state having an entire eastern and western river boundary.

In Wright County is found a curious lake which is entirely surrounded by a wall of stone six feet high and varying in width from five to fifteen feet. No one knows where the water comes from and where it goes as the land adjoining is lower than the water. It is called, on this account, the "Walled Lake."

Iowa produces almost twice the number of hogs produced by any other state.

TEST QUESTIONS ON IOWA.

What is Iowa's position in the United States?

What is the general outline? How does the outline of the eastern boundary differ from the western?

What parts of its boundaries are formed by water?

How does its length compare with its width?

How does Iowa compare in size with Texas?

What other states are in the same latitude?

What are the general characteristics of the surface?

Where is the highest altitude? Where the lowest?

What proportion of the state is drained into the Mississippi?

In what part of the state is the Des Moines river?

What rivers water that part of the state drained into the Missouri?

Where is the lake region? For what are the lakes noted?

What is the extreme difference in temperature? Where is snowfall heaviest?

What minerals are obtained in this state? Where are they found?

How do they rank in value? For what are they used?

What percentage of the surface is devoted to agriculture?

How does Iowa rank in agriculture?

What is the principal crop raised? Where is it raised principally?

What is the annual crop of corn? Does any other state grow more corn?

Name another important agricultural industry. How is it especially adapted?

What other state exceeds Iowa in number of cattle?

Name some manufactures. Are they important?

What railroad facilities has Iowa? What navigable streams?

What is the percentage of illiteracy found in this state?

From what has the school fund been obtained?

Name six important cities. How are they important?

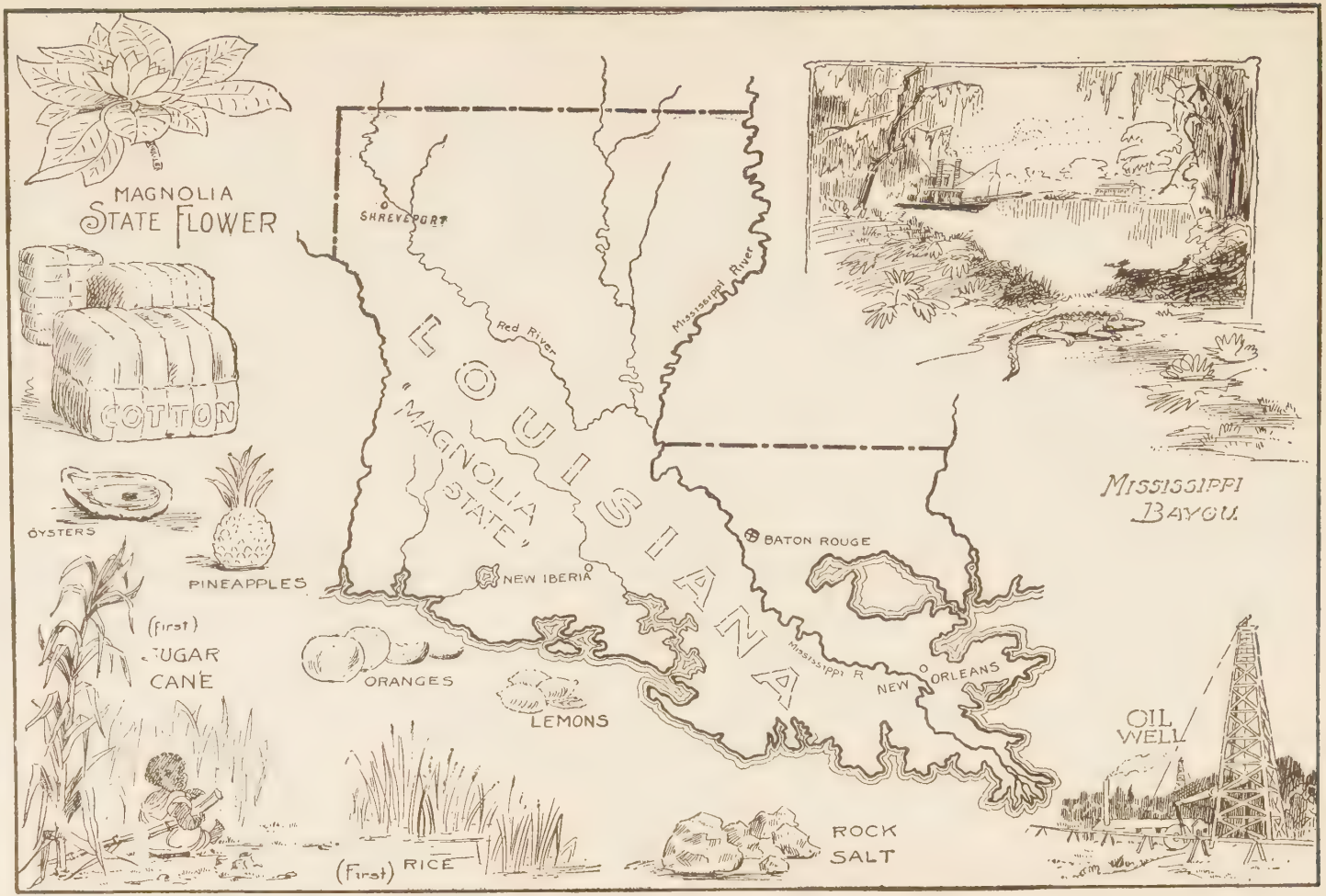
Who were the original inhabitants?

Name three explorers.

When and how did the United States gain possession?

To what territories did Iowa belong?

When was it admitted to the Union?


MAGNOLIA
STATE FLOWER
COTTON
OYSTERS
PINEAPPLES
(first)
SUGAR
CANE
ORANGES
LEMONS
(First) RICE
ROCK
SALT
SHREVEPORT
Red River
Mississippi River
LOUISIANA
"MAGNOLIA STATE"
NEW IBERIA
BATON ROUGE
Mississippi R
NEW ORLEANS
MISSISSIPPI
BAYOU
OIL
WELL

Massachusetts

"Old Bay State."

I. Position.
- Latitude.
- Longitude.
- Relative.
- Comparative.

II. Boundaries.
- Natural.
- Artificial.

III. Coast Line.
- Character.
- Extent.
- Capes.
- Bays.

IV. Surface.
- Divisions.
- Mountains.
- Lowlands.
- Hills.
- Valleys.
- Islands.

V. Waters.
- Rivers.
- Channels
- Lakes.
- Ocean.

VI. Climate.
- Temperature.
- Variations.
- Ocean winds.
- Rainfall.

VII. Resources.
- Minerals.
  - a. Kinds.
  - b. Extent.
  - c. Value.
- Fisheries.
  - a. Varieties.
  - b. Quantity.
  - c. Catching.
  - d. Curing.

VIII. Agriculture.
- Extent.
- Localities.
- Crops.
- Fruits.
- Dairy products.

IX. Manufacturing.
- Facilities.
- Extent.
- Articles.
- Importance.

X. Commerce and Transportation.
- Navigable rivers.
- Railroads.
- Electric lines.
- Foreign.
- Domestic.

XI. Population.
- Present.
- Comparative.
- Square mile.

XII. Cities.
- Capital.
- Seaports.
- Railroad centers.
- Manufacturing centers.
- Size.
- Importance.

XIII. Education.
- Schools.
- Efficiency.
- Established.
- Universities.
- Colleges.

XIV. History.
- Explorers.
- Settlement.
- Colony.
- Early leaders.
- Witchcraft.
- Development.
- Boston Tea Party.
- Revolutionary war.
- Shay's rebellion.
- State constitution.
- Civil war.
- Progress.
- Literary prominence.

ITEMS OF INTEREST.

Massachusetts is a leading state in cod fisheries and in the production of granite.
First in production of cotton and woolen goods, boots and shoes.
First in manufacture of paper from wood pulp.
The first free school and college in the United States was established in this state.
Massachusetts contains a greater number of large cities than any other state.
The Hoosac Tunnel is the longest railroad tunnel in the United States.
The first line of railroad was opened at Quincy, in 1827.

Holyoke is called the "Paper City."

Quincy is called the "Granite City."

Worcester, because of its many schools, is sometimes called the "Academic City."

Worcester is also known as the "Heart of the Commonwealth" on account of its position and influence in political affairs.

Southbridge has the largest spectacle factory in the world.

The lowlands of Cape Cod are noted for their cranberries.

The first cotton mills in America were established at Beverly.

Cambridge contains Harvard, the oldest and richest college in America.

Worcester has the largest wire mills in the world.

The paper on which the United States money is printed is manufactured at Dalton.

Waltham contains the largest watch factory in the world.

Lynn is noted for its boots and shoes.

Lowell is called the "City of Spindles" and manufactures more cotton goods than any other place in the world.

Near Stockbridge is found an ice hole which contains ice the year around. This is caused by such great accumulations of snow that ice remains throughout the summer.

Gloucester is the largest fishing port in the country.

New Bedford is the first seaport in the world in extent of whale fisheries.

QUESTIONS ON MASSACHUSETTS.

What other states are in the same degree of latitude? Longitude?

To what group of states does Massachusetts belong? Why are they so called?

How does Massachusetts compare in size with Texas? California?

What other states have a smaller area?

What is the character of the coast line? How does this affect her commerce?

Name three important bays. What important cities are located on them?

How does the surface of the western part differ from the eastern?

Name two large islands which are included in the boundaries of Massachusetts.

What is the character of the soil? What effect does this have on the agriculture?

To what mountain range do the Berkshire Hills belong? For what is this part of the state noted?

What river divides this state?

What is characteristic of the rivers in Massachusetts? What is the cause?

How does the climate of the coast differ from that of the interior? Of the western boundary? What causes this difference?

In the production of what minerals does Massachusetts lead?

What fish are principally caught? Where are the oyster beds?

Where and how are cod fish caught?

What fruit does Massachusetts raise in abundance? Where is it raised?

What branch of agriculture is principally followed? Why?

What is the leading industry? How does this state compare in the extent of its manufactures?

Name five articles in the manufacture of which Massachusetts leads.

Locate and describe the Hoosac tunnel.

How does the population of Massachusetts compare with that of Texas? What is the population to the square mile?

Name and locate six manufacturing centers in Massachusetts and tell what each is noted for.

For what is Plymouth celebrated? Concord? Lexington?

What is the capital of this state? For what is it noted?

What is the reason for this state's extensive commerce?

Name some exports that pass through Boston. Some imports.
What is noteworthy of the schools of this state?
When and where was the first university founded in America?
Who first explored the coast of Massachusetts?
How many years elapsed before the first permanent settlement?
What is said of the Pilgrims? Name some early leaders.
What is said about witchcraft?
What important events at the beginning of the Revolutionary war took place in Massachusetts?
When was the first state constitution adopted? What did it abolish?
What was the cause of Shay's rebellion?
What political party did Massachusetts favor at first? When did it change?
For what was John A. Andrew conspicuous?
How has this state been prominent?
What six places in Massachusetts do you think would be the most interesting to visit? Why?

Boston

"The Hub of the Universe."

- History.
  - First settlement.
  - Early leaders.
  - Revolutionary war.
  - Anti-slavery movement.
  - Later events.
  - Progress.
- Description.
  - Location.
  - Area.
  - Population.
  - Direction of streets.
  - Business district.
  - Residence portion.
  - Boulevards.
    - Massachusetts avenue.
    - Commonwealth avenue.
    - Strandway.
    - Fenway.
  - Parks.
    - Boston Common.
    - Public Gardens.
  - Monuments.
    - Soldiers and Sailors.
    - Shaw's Memorial.
    - Washington.
    - Everett.
    - Sumner.
- Commerce and Industry.
  - Extent.
  - Harbor.
  - Imports.
  - Exports.
  - Manufactures.
- Transportation.
  - Steam.
  - Electric.
  - Elevated.
  - Subway.
- Public Buildings.
  - Statehouse.
  - City hall.
  - Federal building.
  - Court house.
  - South station.
  - Churches.
  - Hotels.
  - Schools.
  - Institutes.
- Culture.
  - Music.
    - Symphony Orchestra.
    - Symphony Hall.
    - Schools of music.
  - Art.
    - Museum of Fine Arts.
    - Art schools.
    - Theaters.
- Historical Features.
  - Old statehouse.
  - Old South Meeting House.
  - Christ Church.
  - King's chapel.
  - Faneuil Hall.
  - Old burying grounds.

INTERESTING ITEMS.

Boston is the largest market in the world for leather goods.
This city is sometimes called the "Athens of America."
The largest circulating library in the world is located in Boston.
Boston Common is the oldest public park in America.
In foreign commerce Boston ranks second in the United States.
Boston is the commercial center of the New England states.
The statue of Washington, which stands at the entrance of the Public Gardens, is considered one of the six great equestrian statues in the world.
The South railway passenger station in Boston is said to be the largest in the world.

TEST QUESTIONS ON BOSTON.

Which has the larger population, Boston or St. Louis? Boston or Baltimore?
What famous university is within a few minutes' ride of the city?
What is peculiar about the way Boston is laid out?
From what point do the streets radiate?
Which streets are the important business thoroughfares?
Which street is the great financial center of the city?
How many miles of streets are paved?
For what is Charleston noted? What is interesting about Roxbury?
How are the numerous sub-divisions of Boston connected?
Why is such great interest attached to the *Common?*
What historic associations has it? How many acres does it cover?
How long has it been used as a pleasure ground? What noted monuments are in the Common?
What event in history does the Soldiers' and Sailors' monument commemorate?
What noted statues are in the Public Garden?
Which is the most important of the historic structures?
When was the old State House built? What use has it served? What historic *scenes* were enacted within this building?
When was King's Chapel established? How does it figure in history?
Why is Faneuil Hall known as the Cradle of Liberty?
What distinguishes the Boston Theater?
What theaters are worthy of mention?
Why is the Boston Public Library considered one of the finest buildings in the country?

(a)
(b)
(c)

How many volumes does it contain?
What school in Boston is the most noted of its kind in the country?
What place does Boston occupy as a commercial and financial center?
In this respect how does it compare with New York?
What natural advantages has it for foreign commerce?
What other interests are centered here?
When was the first settlement on the peninsula made and by whom?
When was the first meeting house erected? The first school building?
What part did Boston take in the events which led to American independence?

History Topics (look up):

(a) Boston Massacre
(b) Boston Tea Party
(c) Battle of Lexington
(d) Battle of Bunker Hill

Name ten noted writers who have lived in Boston.

Michigan

"The Lake State."
"Wolverine State."

I. Situation.
- Relative.
- Boundaries.
- Position.

II. Size.
- Area.
- Length.
- Breadth.
- Shape.

III. Coast Line.
- Extent.
- Regular.
- Irregular.
- Bays.
- Peninsulas.

IV. Surface.
- Divisions.
- Undulating.
- Level.
- Mountainous.

V. Waters.
- Rivers.
- Falls.
- Lakes.

VI. Climate.
- Variations.
- Causes.
- Rainfall.

VII. Minerals.
- Varieties.
- Value.
- Usefulness.

VIII. Industries.
- 1. Agriculture.
  - Unique feature.
  - Soil.
  - Crops.
  - Fruits.
  - Peppermint.
  - Live stock.
- 2. Manufacturing.
- 3. Lumbering.
- 4. Fishing.

IX. Commerce.
- Water routes.
- Railroads.
- Exports.
- Imports.

X. Cities.
- Important ones.
- Lake ports.
- Manufacturing centers.

XI. Education.
- Public schools.
- Normal schools.
- State university.

XII. History.
- Early missionaries.
- Pontiac's war.
- Territorial.
- War of 1812.
- Admission.

ITEMS OF INTEREST.

Michigan has a larger coast line than any other state.
The State Normal College at Ypsilanti was the first one established west of New York.
Michigan leads the world in the production of peppermint.
First state in production of salt and second in beet sugar.
Michigan has the greatest facilities for water transportation of any state.
Michigan is an Indian name meaning "A river for fish."
Detroit is known as the "Gibraltar of the Lakes."
Peat deposits are found in the northern peninsula of Michigan.
Michigan is called the "Peninsula State" and the motto of the state is "If thou seekest a beautiful peninsula, look around."
Michigan produces 38 per cent of the salt obtained in the United States.
Battle Creek contains the largest medical sanitarium in the world.
Kalamazoo is noted for its celery.
Detroit has the best harbor of any city on the Great Lakes and is the largest center in the world for stoves, railroad cars and emery wheels.
Michigar ranks second in iron ore and third in copper.

QUESTIONS ON MICHIGAN.

In what latitude is Michigan? What effect does this have on the climate? What other countries are in the same latitude?

What is the general shape of this state? How is it divided? What are the divisions called?

How do the boundaries of Michigan differ from other states?

Name some important bays. On what bodies of water are they situated?

How does Michigan's position affect her commerce?

For what are the small lakes noted? How many more lakes than islands?

Why is the temperature on the western coast milder than ten miles inland?

How does Michigan rank in production of minerals?

Name four important minerals. Where found?
What other states produce more copper? More iron?
What process is used to obtain salt?
What part of this state is adapted to agriculture? What part to fruit?
What is the most important fruit raised? What is the annual crop?
What is a peculiarity in the agriculture of this state?
What industry is associated with Grand Rapids? Kalamazoo?
How does Michigan compare in tonnage of ships with other coast states?
What are some of the principal exports?
In what year was Michigan first visited? By whom?
How many years elapsed before the first permanent settlement?
How did the United States gain possession?
To what territory did Michigan originally belong? When did it become a separate territory?
What delayed its admission into the Union?
What two issues have been important in this state's politics?
From what does Michigan take its name? What does it mean?
What is the state motto?

Minnesota

"The Gopher State."
"The North Star State."

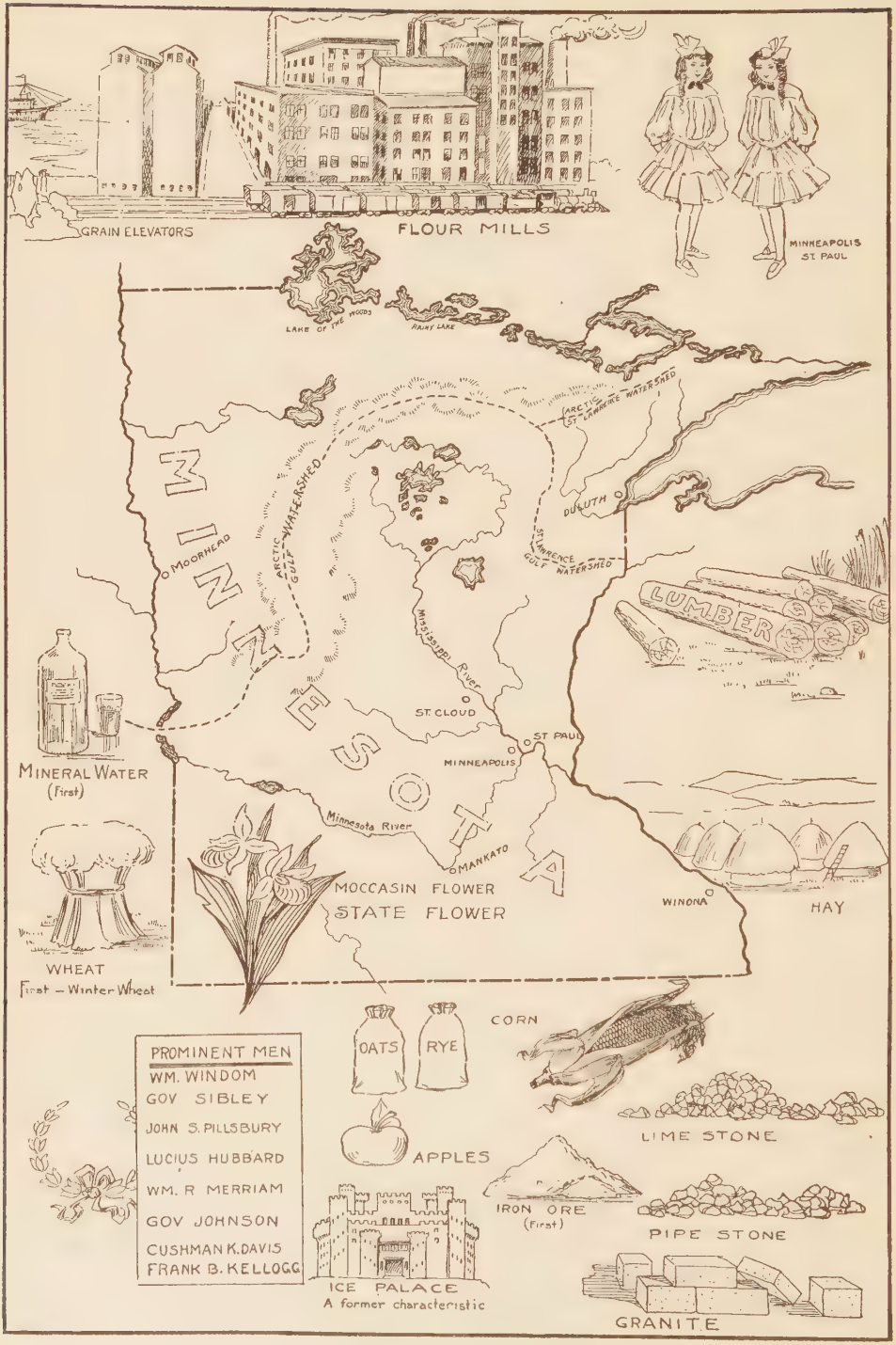
I. Situation.
- To what group of states does Minnesota belong?
- What is its relative position in the United States?
- What approximate proportion of its boundaries are made up of water?
- Compare its position with that of Ontario.
- Which extends farthest north, Minnesota or Maine?

II. Size.
- What other states are larger than Minnesota?
- How does the length of Minnesota compare with the width of Texas?
- How many times will Minnesota contain a state the size of Massachusetts?

III. Surface.
- Describe the general character of the land.
- Where is the highest and where the lowest altitude?
- What proportion of its area is composed of water?
- Where is the height of land located? What purpose does it serve?

IV. Drainage.
- How many river systems in Minnesota? What territory does each system drain?
- How does the water of the lakes on the north finally reach Hudson Bay?
- Where is the lake region? How many lakes has Minnesota?
- What and where is the water shed in this state?

V. Climate.
- Why are changes in temperature in this state less noticeable than in Illinois?
- What are the characteristics of the four seasons in Minnesota?


GRAIN ELEVATORS
FLOUR MILLS
MINNEAPOLIS
ST. PAUL
LAKE OF THE WOODS
RAINY LAKE
ARCTIC
ST. LAWRENCE WATERSHED
MINNESOTA
ARCTIC
GULF WATERSHED
DULUTH
MOORHEAD
ST. LAWRENCE
GULF WATERSHED
LUMBER
Mississippi River
ST. CLOUD
ST. PAUL
MINNEAPOLIS
MINERAL WATER
(First)
Minnesota River
MANKATO
MOCCASIN FLOWER
STATE FLOWER
WINONA
HAY
WHEAT
First — Winter Wheat
PROMINENT MEN
WM. WINDOM
GOV SIBLEY
JOHN S. PILLSBURY
LUCIUS HUBBARD
WM. R MERRIAM
GOV JOHNSON
CUSHMAN K. DAVIS
FRANK B. KELLOGG
OATS
RYE
CORN
APPLES
LIME STONE
IRON ORE
(First)
PIPE STONE
ICE PALACE
A former characteristic
GRANITE

VI. Natural Resources.

What is the most important mineral found in Minnesota? Where is it found?

How is iron ore smelted?

VII. Population.

What is the average population to the square mile?

What would be the approximate population if as thickly settled as Rhode Island?

What part of the state is practically unsettled?

VIII. Leading Industries.

Name the five most important industries.

In what way do they differ from the industries of Indiana?

What are some of the crops raised? What part is best adapted to the cultivation of wheat?

To what does Minnesota owe the rapid development of her industries? Why?

IX. Commerce and Cities.

What are some of the various means of transportation in this state?

What products are exported? What are imported?

What are the leading manufacturing centers?

Name some important lumber centers.

For what is Minneapolis noted? St. Paul? Duluth?

On what bodies of water would a cargo of wheat travel in going from Duluth to New York?

X. History.

What retarded its growth? How was it overcome?

Name the most important issue since the Civil war? How was it settled?

How did the state get its name? What is its meaning?

XI. Education.

In what way does the educational system differ from Illinois?

Name some of the important institutions of learning.

XII. Government.

Is the legislative department different from that of Pennsylvania? In what respect?

What officials constitute the executive department? What are their terms of office?

To what branch of the government do the supreme and district courts belong?

What is the state motto? Why is it appropriate?

ITEMS OF INTEREST.

St. Paul and Minneapolis are sometimes called the "Twin Cities."

Duluth is known as the "Zenith City" and the "Gateway of the East."

St. Anthony's Falls affords water power for over twenty-four flour mills.

Red River of the North is said to be the straightest river of its size in the United States.

Minnesota is an Indian name meaning "Sky tinted water."

The state motto is "The Star of the North."

Both Mississippi River and Great Lakes navigation begin in Minnesota.

Minneapolis is sometimes called the "Sawdust City" on account of the large number of saw mills.

The magnetic iron ore found near Vermillion Lake is the purest found anywhere.

The Pipestone Quarry near Pipestone, Minn., is the only one of its kind in the world. The stone is soft when first quarried and hardens rapidly after being exposed to the air.

Minnesota ranks first in production of spring wheat and mineral waters.

Produces nearly one-half of the iron ore in the United States.

"Twin Cities"

MINNEAPOLIS.

- Situation.
- Size.
- Divisions.
- Places of Interest.
  - Lake Calhoun.
  - Lake Harriet.
  - Minnehaha falls.
  - Riverside park.
  - Falls of St. Anthony.
  - Mississippi river.
  - University of Minnesota.
- Industry.
  - Manufacturing center.
  - Commercial center.
  - Flour mills.
  - Saw mills.
  - Wheat market.
  - Mercantile business.
- History.
  - Settlement.
  - Cause of growth.
  - Incorporation.

ST. PAUL.

- Location.
- Terraces.
- Divisions.
- Places of Interest.
  - Como park.
  - Phalen park.
  - Indian Mound park.
  - Fort Snelling.
  - Agricultural College.
  - Capitol building.
- Commerce and Industry.
  - Favorable situation.
  - Railway center.
  - Transshipping.
  - Wholesale trade.
  - Manufactures.
    - Industrial plants.
    - Meat packing.
  - Electric car system.
- History.
  - Origin of name.
  - Growth.

INTERESTING FACTS.

St. Paul is located on several terraces on the left bank of the Mississippi river, 2,200 miles north of its mouth.

Steamboat navigation for large boats starts at St. Paul.

Minneapolis manufactures more flour than any other city in the United States.

The Twin Cities have one of the most perfect street car systems in the country.

Water power for its many mills and factories is obtained from the Falls of St. Anthony.

Pillsbury's A mill has a capacity of 7,000 barrels daily and is the largest of its kind in the world.

The manufacture of lumber is also an important industry in Minneapolis, the saw mills turning out over half of the lumber produced in Minnesota.

QUESTIONS.

Minneapolis.

How does the area of Minneapolis compare with that of St. Paul?

In what part of the city are the Falls of St. Anthony?

What great industrial establishments center around these falls?

For what is Minnehaha park noted?

What is the most important industry of Minneapolis? What other industry does this occasion? What industry ranks second in importance?

What is meant by a primary wheat market? Name the most important one.

St. Paul.

What is visible from all points in St. Paul? Why is this possible?

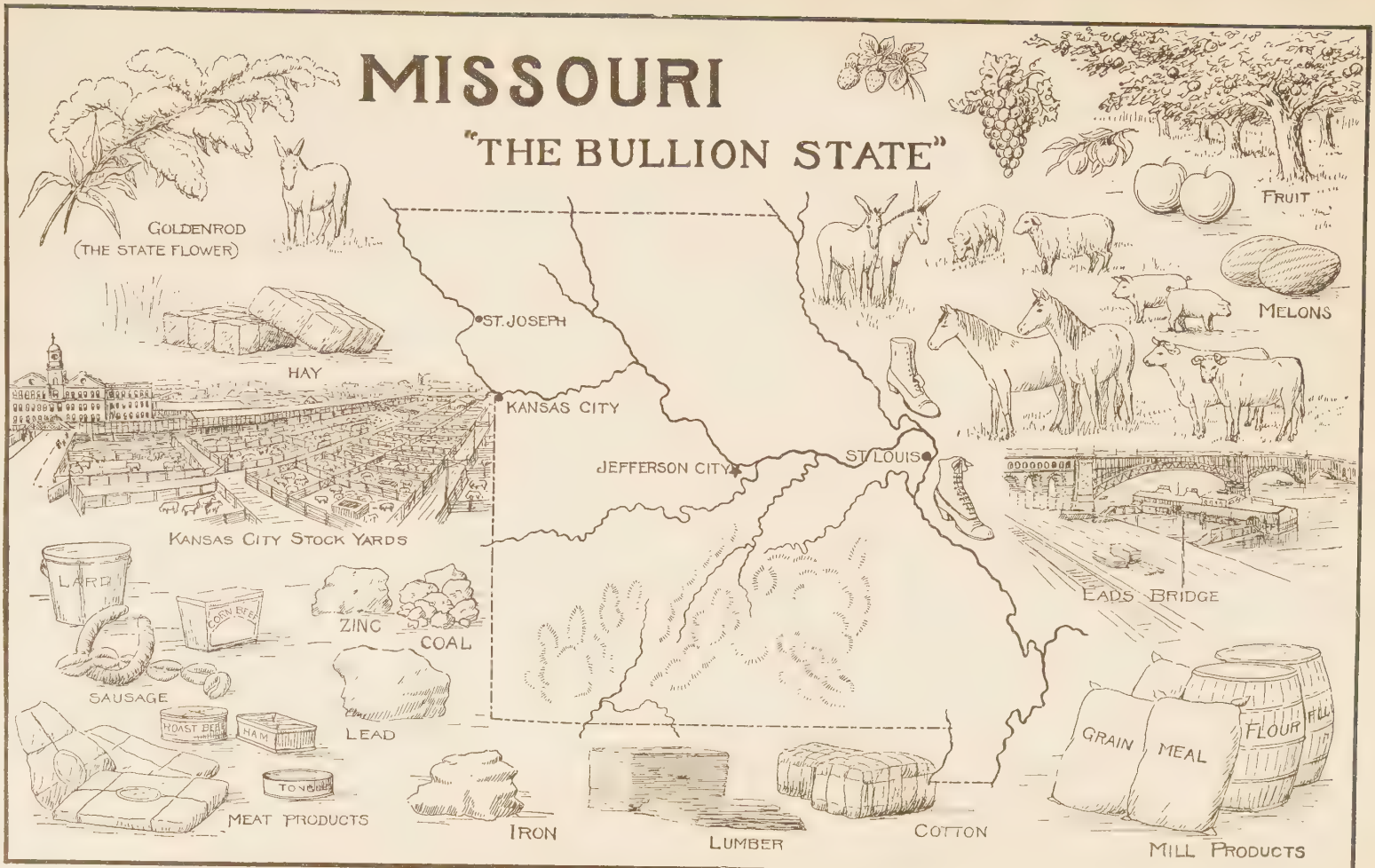
How is this city laid out? What characterizes each division?

How has St. Paul's location affected her commerce? Of what is it the center?

What is meant by "transshipment"? To what extent is it carried on in this city?

What was the original name for this city? When and how did it get its present name?

What has been an unusual feature of its history?


MISSOURI
"THE BULLION STATE"
GOLDENROD
(THE STATE FLOWER)
HAY
ST. JOSEPH
KANSAS CITY
JEFFERSON CITY
ST. LOUIS
KANSAS CITY STOCK YARDS
FRUIT
MELONS
EADS BRIDGE
LARD
CORN BEEF
SAUSAGE
ZINC
COAL
LEAD
ROAST BEEF
HAM
TONGUE
MEAT PRODUCTS
IRON
LUMBER
COTTON
GRAIN
MEAL
FLOUR
MILL PRODUCTS

Missouri

"Iron Mountain State."

- Location.
  - Latitude.
  - Longitude.
  - Position in United States.
- Boundaries.
  - Natural.
  - Political.
- Extent.
  - Length.
  - Breadth.
  - Area.
    - Total.
    - Comparative.
- Population.
  - Present.
  - Comparative.
- Surface.
  - Diversity.
  - Slope.
  - Grand Divide.
  - Mountains.
  - Prairies.
  - Swamps.
- Climate.
  - Characteristics.
  - Variation.
  - Seasons.
  - Winds.
  - Rainfall.
- Natural Resources.
  - Soil.
  - Mineral wealth.
  - Forests.
  - Water power.
  - Navigation.
- Industries.
  - Agriculture.
    - Extent.
    - Variety.
    - Farming.
    - Stock raising.
  - Mining.
    - Minerals.
    - Location.
    - Value.
    - Use.
- Industries.—Cont.
  - Manufacturing.
    - Variety.
    - Rank.
    - Articles.
  - Lumbering.
    - Kinds.
    - Value.
  - Quarrying.
    - Localities.
    - Extent.
  - Commerce.
    - Facilities.
    - Amount.
    - River traffic.
    - Railroads.
- Productions.
  - Agricultural.
    - Live stock.
    - Cereals.
    - Vegetables.
    - Fruits.
  - Mineral.
    - Iron.
    - Coal.
    - Zinc.
    - Clays.
    - Building stones.
    - Glass sand.
    - Nickel.
- Education.
  - School System.
  - Higher Institutions.
  - Universities and colleges.
- History.
  - Explorers.
  - Treaty of Paris.
  - Louisiana Purchase.
  - Missouri Compromise.
  - First railroad.
  - Civil war.
  - Later events.

INTERESTING ITEMS.

Missouri ranks first in the production of lead and zinc; second in mules, and third in corn.

In point of size and richness, the broad alluvial valleys of this state stand unsurpassed.

The climate of this state can be easily judged from the fact that it is known as "The Fair Weather State," and "The Italy of the Mississippi Valley."

Missouri shares in the navigation of the two greatest rivers in the United States.

This state is not excelled by any other state in the variety of its products.
Missouri produces the largest number of watermelons among the states.
Kansas City is the second live stock market in the United States.
Jefferson City has been the capital of Missouri since 1826 and is located on the south bank of the Missouri river, near the center of the state.
Over one-half of the total zinc produced in the United States comes from near Joplin.
Missouri ranks fifth in population.
The largest electric light plant in the world is located at Grand Falls.
The oldest town in the state is St. Genevieve.
The state motto is: "Let the welfare of the people be the supreme law."

QUESTIONS.

Into what sections is this state divided? What has caused the division?

How is the southern portion of the state divided? What are the characteristics of each section?

What can you tell of the diversity of surface in this state?

What other states are larger than Missouri? What percentage of its area is composed of water?

What two great rivers form a part of its boundaries? Name and locate some of their tributaries.

Does this state's situation affect her climate? In what way? How does the northern part differ from the southern?

What mineral products are found in this state? In the production of what minerals does this state lead?

How does Missouri's position and climate affect her agriculture? How do the products raised in various parts of the state differ?

What crops are raised in the northern and western parts of the state? The central? The southern?

What animals are raised? What industry has this developed in some of the cities?

How do the manufactures of this state compare with other states west of the Mississippi?

Name four important industries and the cities where they are carried on most extensively.

What advantages has this state for commerce? What articles are exported? What imported?

What part of the state has the best railroad facilities? How does its mileage compare with that of Illinois? Indiana?

In what way do the industrial interests of Joplin differ from those of Kansas City? What are the principal industries of St. Louis?

What noted Spanish explorer visited this state? In what year?

What connection did the Treaty of Paris have with this state?

By what means was it secured by the United States? In what year?

What was the Missouri Compromise? When was this state finally admitted to the Union?

What position did it take in the Civil war?

Describe the progress this state has made in late years. What rank does it now hold among the other states in the Union?

St. Louis

"The Mound City."

HISTORY.
- Trading post.
- Spanish territory.
- French territory.
- Louisiana territory.
- Incorporation.
- Missouri territory.
- Capital of state.
- Growth.
- Present population.

DESCRIPTION.
- Situation.

- In state.
- In United States.
- On river.
- Area.
- Population.
- Rank.

PARKS.

- Area.
- Forest park.
  - Size.
  - Description.
- Shaw's Gardens.
  - Fame.
  - Beauty.
  - Size.
- Other parks.

BUILDINGS.

- Characteristics.
- Public buildings.
- Historic buildings.
- Office buildings.
- Churches.
- Hotels.
- Charitable Institutions.

EDUCATION.

- School system.
- Libraries.
- Universities.

INDUSTRIES.

- Wholesale trade.
- Manufacturing center.
- Output of factories.
- Articles manufactured.

COMMERCE.

- Railroads.
  - Number.
  - Tunnels.
  - Cupples' station.
  - Union station.
- Distributing point.
- River traffic.
- Ead's Bridge.
- Merchants' Bridge.

ITEMS OF INTEREST.

The largest hardware and drug houses in America are found in this city.

St. Louis contains the largest brewery in the world, the interior of which is like a small city.

Commerce and manufacturing are its chief industrial interests.

St. Louis is an important railroad center, and its Union passenger station is considered one of the finest in America.

St. Louis ranks first in trade in mules and horses and second in the manufacture of flour.

St. Louis manufactures the largest number of street cars in the world.

It is the largest city west of the Mississippi river and is the commercial metropolis of the Mississippi valley.

Shaw's Botanical Gardens, in this city, are said to be the finest in the world.

St. Louis has developed rapidly in size and wealth, and in the last ten years has put up over 26,000 new buildings.

QUESTIONS.

What other cities in the United States have a larger population than St. Louis?

What proportion of the total area covered by parks is contained in Forest park? For what was the western half of this park used?

What famous gardens are located in this city? For what are they noted?

What is characteristic of the buildings of this city?

Name and describe three important public buildings in this city.

How was the public library obtained? How many volumes does it contain?

For what section of the country is St. Louis a distributing point?

How does this city rank in transshipment of goods?

What is the Cupples' station? What amount of freight can be handled in twenty-four hours?

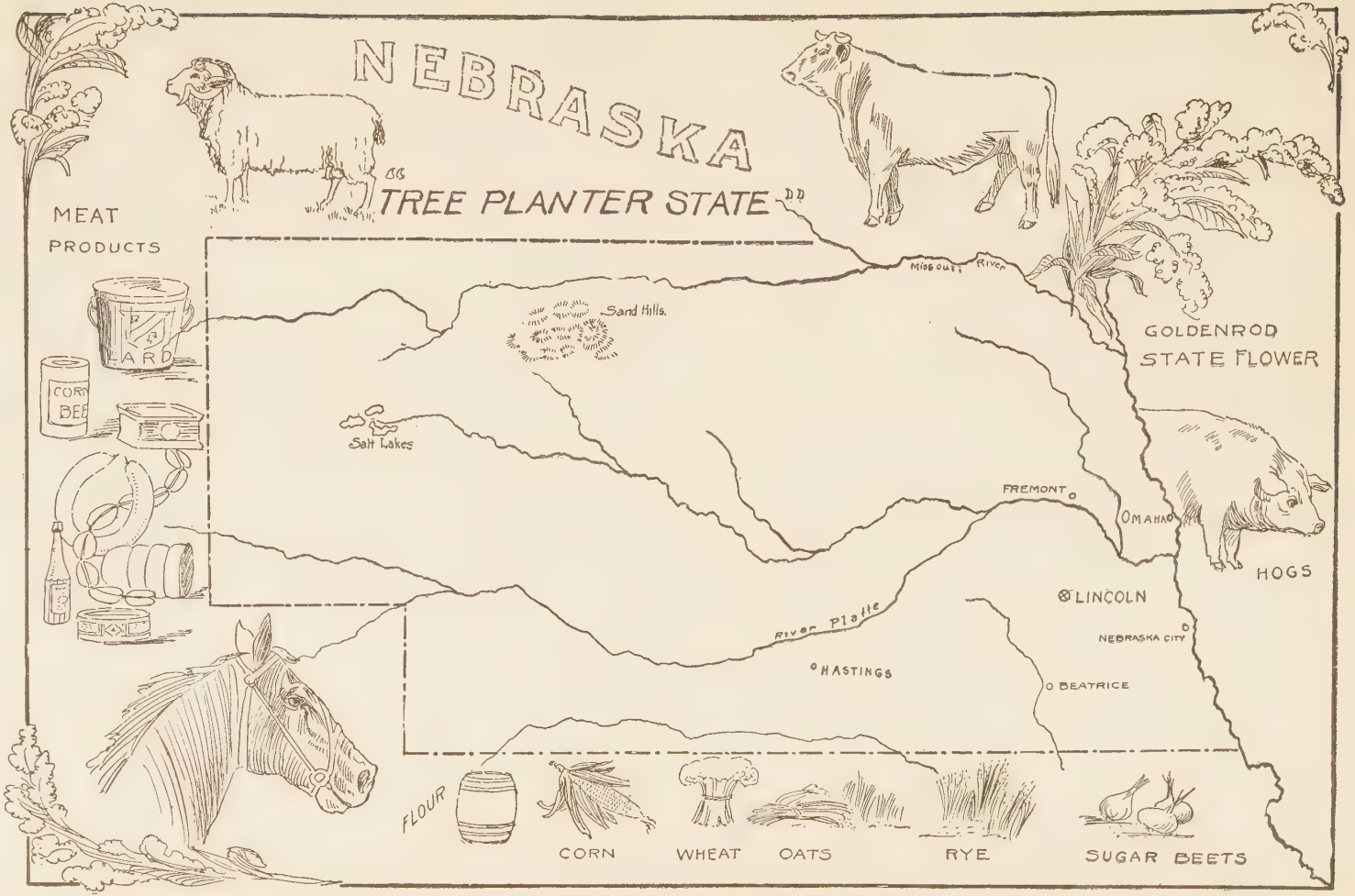
What is the value of the annual factory outputs?

Of what do its manufactured products consist?

For whom was this city named?

To what different countries did it belong?

What progress has it made in growth and wealth?


NEBRASKA
"TREE PLANTER STATE"
MEAT PRODUCTS
LARD
CORN BEEF
Sand Hills
Salt Lakes
Missouri River
GOLDENROD STATE FLOWER
FREMONT
OMAHA
HOGS
LINCOLN
NEBRASKA CITY
River Platte
HASTINGS
BEATRICE
FLOUR
CORN
WHEAT
OATS
RYE
SUGAR BEETS

Nebraska

"Tree Planter State."

I. Situation.
- What is the relative position of Nebraska in the United States?
- What is the difference in latitude between Nebraska and Georgia?

II. Surface.
- What is the difference in altitude from the southeast corner to the western boundary?
- What is the general character of the surface?
- What is meant by "bad lands"? Where are they situated?

III. Waters.
- What river drains the principal part of this state?
- What are the two river systems? What divides them?
- What territory do they drain?
- Are there any important lakes?

IV. Climate.
- What are the characteristics?
- What is the average temperature?
- In what way does the atmosphere resemble that of Minnesota?
- How does the rainfall differ in different sections?

V. Minerals.
- Is Nebraska an important state in mineral resources?
- What minerals are found there? Where are they found?

VI. Agriculture.
- What is the general character of the soil?
- What is meant by irrigation? Where is it practiced?
- What are the leading crops? What one grain occupies the most acreage?
- What part of the state is devoted to stock raising?

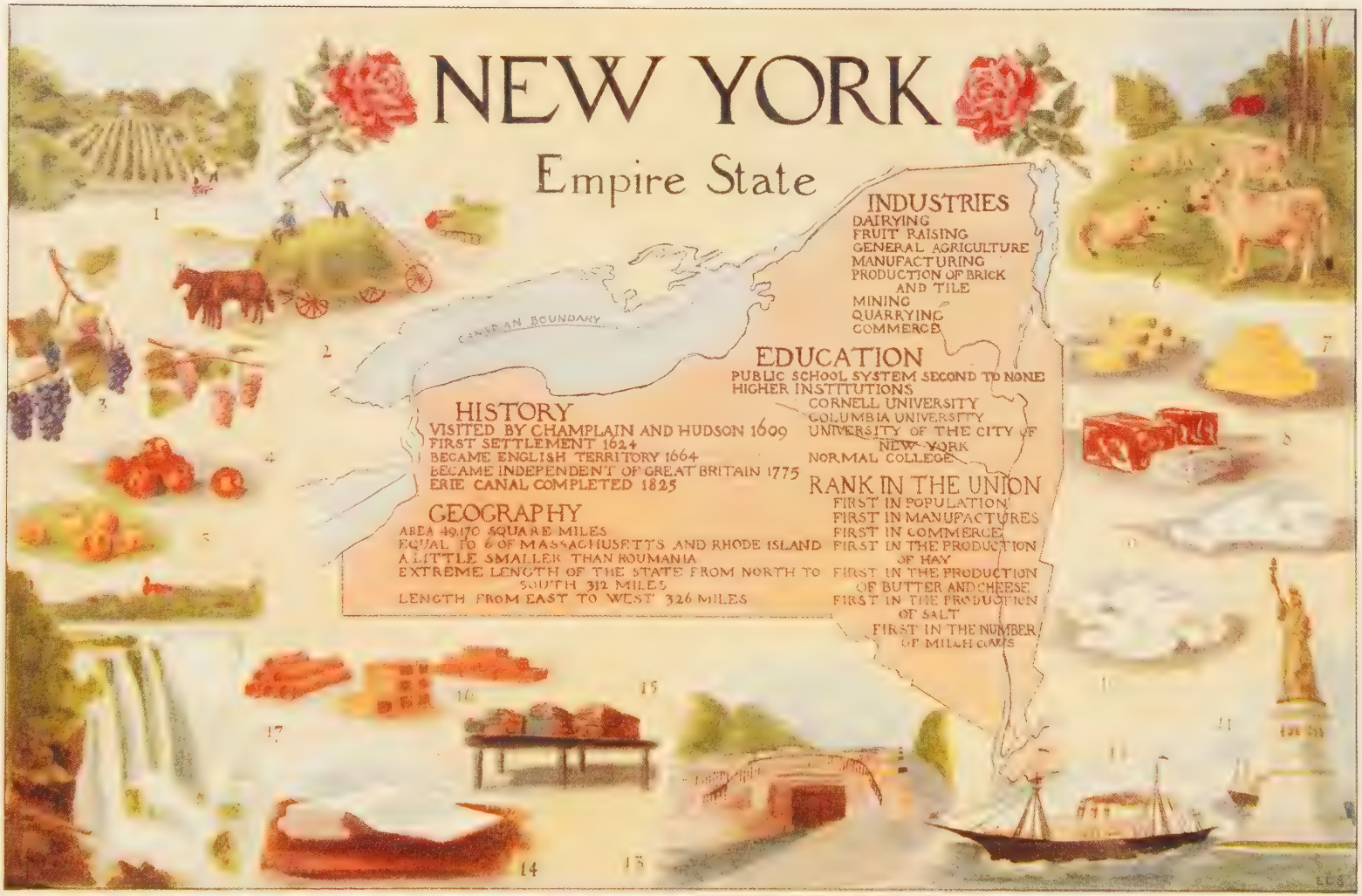
VII. Population.
- What is the average population to the square mile?
- What proportion of the total population are negroes? Indians?
- How does Nebraska rank in population with other states?

VIII. Manufactures.
- Is manufacturing an important industry in this state?
- What special industries are carried on?
- What important industry is carried on at South Omaha?

IX. Commerce.
- What portion of this state has the best railroad facilities?
- How does its mileage compare with that of Illinois?
- How do Nebraska's exports differ from those of Michigan?
- What are some of the imports?

X. Education.
- From what is the school fund derived?
- What is the percentage of illiteracy among the white population?
- How are the city schools managed? The country schools?
- Name three universities in this state.

XI. History.
- Name two early explorers.
- How was this state connected with the Louisiana Purchase?
- When was Nebraska established as a territory?
- When was it admitted to the Union?
- What progress has it made?



1, Nursery.
2, Hay Harvest.
3, Grapes.
4, Apples.
5, Peaches.
6, Jersey Cows.
7, Dairy Products.
8, Marble.
9, Salt.
10, Building Stone.
11, Statue of Liberty.
12, Freight Steamer.
13, Lock on Erie Canal.
14, Cloth.
15, Clothing.
16, Brick and Tile.
17, Niagara Falls.

ITEMS OF INTEREST.

Nebraska is an Indian name meaning "Water Valley."
Grand Island is noted for the manufacture of beet sugar.
The percentage of illiteracy among the white population of this state is 8.2 per cent.
At Long Pine, North Platte, Alliance and McCook central time changes to western.
Omaha has the largest smelting works in the United States.
Nebraska ranks third in number of swine.

New York

"THE EMPIRE STATE."

I. LOCATION.
- Position in U. S.
- Latitude and longitude.
- Boundaries.

II. SIZE.
- Length.
- Breadth.
- Area.
- Comparative.

III. OUTLINE.
- Irregular.
- Map study.

IV. SURFACE.
- Diversity.
- Characteristics.
- Mountain regions.
- Valleys.
- Plateaus.
- Plains.

V. DRAINAGE.
- River systems.
- Lakes.
- Waterfalls.

VI. CLIMATE.
- Variety.
- Influence.
- Rainfall.

VII. MINERAL RESOURCES.
- Variety.
- Value.
- Importance.
- Uses.

VIII. AGRICULTURE.
- Importance.
- Character.
- Variety.
- Localities.

IX. INDUSTRIES.
- Manufacturing.
- Extent.
- Variety.
- Quarries.
- Lumber.

X. COMMERCE.
- Volume.
- Cause.
- Railways and canals.
- Imports and exports.

XI. CITIES.
- Important ones.
- Characteristics.
- Population.

XII. EDUCATION.
- Public schools.
- Officers.
- Normal schools.
- Universities.

XIII. GOVERNMENT.
- 1. Legislative.
  - Members.
  - Terms.
- 2. Executive.
  - Officers.
  - Terms.
- 3. Courts.
  - Classes.
  - Judges.
  - Terms.

XIV. HISTORY.
- Early settlement.
- Revolutionary war.
- Constitution.
- Civil war.
- Later history.
- Prominent men.

ITEMS OF INTEREST.

New York is the first state in the Union in population, value of farm products, manufacturing industries and extent of commerce.

The East River is the busiest river of its size in the world.

The Bartholdi statue, "Liberty Enlightening the World," which stands at the entrance of New York Harbor, is 305 feet high from the foundation to the top and is the largest statue in the world.

Two-thirds of the leather gloves and mittens manufactured in the United States are made at Gloversville and Johnstown.

Troy manufactures more shirts, cuffs and collars than any other place in the United States.

Buffalo is known as the "Queen City of the Lakes."

West Point is called the "Military City."

Syracuse is noted for its salt; Oswego for its starch.

Brooklyn is known as the "City of Churches," and contains the largest church in the United States.

Rochester is sometimes called the "Flour City."

The most important industry of New York City is the manufacture of clothes.

New York ranks first in production of gypsum, potatoes and hay.

QUESTIONS ON NEW YORK.

To what group of states does New York belong?

What states form its boundaries? What water?

What proportion of lakes Erie and Ontario belong to New York?

How does New York compare in size with California? With Montana?

Into how many physical regions is New York divided ? How are they characterized?

Name three mountain ranges. In what part of the state are they located?

To what range does Mt. Marcy belong? Slide Mountain?

Where is the plateau region? The lake shore plain?

What is the most important river in the state? What does it drain?

How is the northeastern portion of the state drained?

Name three important falls. How do they affect this state's industries?

What three things affect the climate of New York?

What is the average temperature? Rainfall?

What minerals are found in the vicinity of the Hudson river?

How does New York compare with Minnesota and Michigan in the production of iron ore?

Does any other state produce more oil? How much more?

In the production of what mineral does New York rank first?

What tends to give the wide diversity in agricultural interests?

How do the farms along the Hudson differ from those of the plateau region? What crops are raised?

Name the chief manufacturing centers.

How does New York compare with other states in the extent of its manufactures?

Name the most important city. How is it distinguished? For what is Buffalo important? Troy? Rochester?

Who is at the head of the public school system? What is the state board of regents?

Name three important universities. Are any of them connected with the state?

How does New York rank in commerce? In what way is it especially adapted?

What proportion of the exports of the U. S. pass through New York? What imports?

What does the Erie canal connect? How long is it?

What two noted explorers first visited New York?

When was New York City founded? What was its original name?

When did the Dutch give up New York? What was the cause?

What noted man played an important part in the Spanish-American war?

Name some noted men that have come from this state.

New York City

"Empire City."

DESCRIPTION.
- Location.
- Area.
- Population.
- Boroughs.

ADVANTAGES.
- Natural.
  - On ocean.
  - On river.
  - Harbor.
- Artificial.
  - Railroads.
  - Docks.
  - Cable stations.
  - Wireless stations.
  - Bridges.
  - Ferries.

PARKS.
- Battery.
- Riverside.
- Central.
- Bronx.

MONUMENTS.
- Statue of Liberty.
- Obelisk.
- Washington.
- Grant's Tomb.

COMMERCE.
- Facilities.
- Extent.

MANUFACTURES.
- Amount.
- Variety.
- Value.
- Most important.
  - Clothing.
  - Sugar refining.
  - Molasses refining.
  - Printing.
  - Publishing.

BUILDINGS.
- Postoffice.
- Sub-treasury.
- Custom house.
- Hotels.
- Theaters.
- Churches.
- Libraries.
- Museums.
- Universities.
- Charitable institutions.
- Stock Exchange.

HISTORY.
- Henry Hudson.
- Colonization.
- Government.
- Revolutionary war.
- Washington inaugurated.
- Growth.
- Tweed Ring.
- Prosperity.

ITEMS OF INTEREST.

Wall street is the financial center of the United States.

The first president of the United States was inaugurated in this city.

New York is the largest city in the Western Hemisphere and second largest in the world.

Central park is one of the finest parks in the world and contains an obelisk sent from Egypt by Ismail Pasha at the expense of William H. Vanderbilt.

New York City spends more for public education than any other city in the world.

The commerce of New York City is five times greater than that of the next largest American port.

In manufactures, New York surpasses every other city in the United States by more than 50 per cent.

New York ranks first in the printing and publishing business.

QUESTIONS.

Who was the first white man to enter New York harbor? How many years elapsed before the visit of Henry Hudson?

Which is more valuable, the foreign or coast trade of this city?

Name two ways in which New York outranks other cities in her manufactures.

Where is the most densely populated district? What is the average population to the acre in this district? What percentage is foreign?

North Carolina

"The Old North State."

Location.
- Latitude.
- Longitude.
- Position in the U. S.

Size.
- Length.
- Breadth.
- Area.
- Compared with other States.
- Population.

Surface.
- Coastal plain.
- Piedmont plateau.
- Highlands.

Drainage.
- River systems.
- Rivers.

Climate.
- Temperature.
- Rainfall.
- Healthfulness.

Resources.
- Mineral.
- Agriculture.
- Forests.
- Fisheries.

Industries.
- Agriculture.
- Lumbering.
- Mining.
- Quarrying.
- Fishing.
- Manufacturing.
- Commerce.

Government.

Education.
- Public School System.
- State Institutions.
- Other Institutions.

History.
- Early explorations.
- First settlement.
- Approved Federal Constitution.
- Part in the Civil War.

QUESTIONS.

For what forest products is North Carolina noted?
What portions of the state are mountainous?
Are there any high mountain peaks in the state? If so, name them.
What parts of the state are frequented as pleasure resorts, both summer and winter?
What is tar? How is it made?
What is turpentine? How is it made?
What and where are the Pine Barrens?
What exports of the state are known as naval stores?
What and where is the Piedmont Belt?
What parts of the state are noted for their production of sweet potatoes? Of peanuts?
What minerals are found in the state?
Where are these minerals located?
Are any precious stones found in North Carolina? If so, name them.
Why do the fisheries constitute an important industry?
Name and locate the chief cities.
What are the leading manufactures?
What are the chief railway centers?

Ohio

"The Buckeye State."

Location.
1. Latitude.
2. Longitude.
3. Position in the U. S.
4. Boundaries.

Size.
1. Length.
2. Breadth.
3. Area.
4. Shape.
5. Relative size.

Surface.
1. Highlands.
   Mountains.
   Plateaus.
2. Prairies.
3. Watershed.

Drainage.
1. Drainage districts.
   Lake Erie District.
   Ohio River District.
2. Rivers.
   Maumee.
   Sandusky.
   Cuyahoga.
   Grand.
   Great Miami.
   Little Miami.
   Hocking.
   Scioto.
   Muskingum.
   Ohio.

Climate.
1. Temperature.
2. Rainfall.
3. Healthfulness.

Mineral Resources.
1. Coal.
2. Petroleum.
3. Natural Gas.
4. Clay.

Agriculture.
1. Wheat raising.
2. Fruit growing.
3. Sheep raising.

Manufactures.
1. Iron and steel.
2. Grist mill products.
3. Clay products.
4. Malt and distilled liquors.

Cities.
1. Columbus.
2. Cleveland.
3. Cincinnati.
4. Toledo.
5. Dayton, etc.

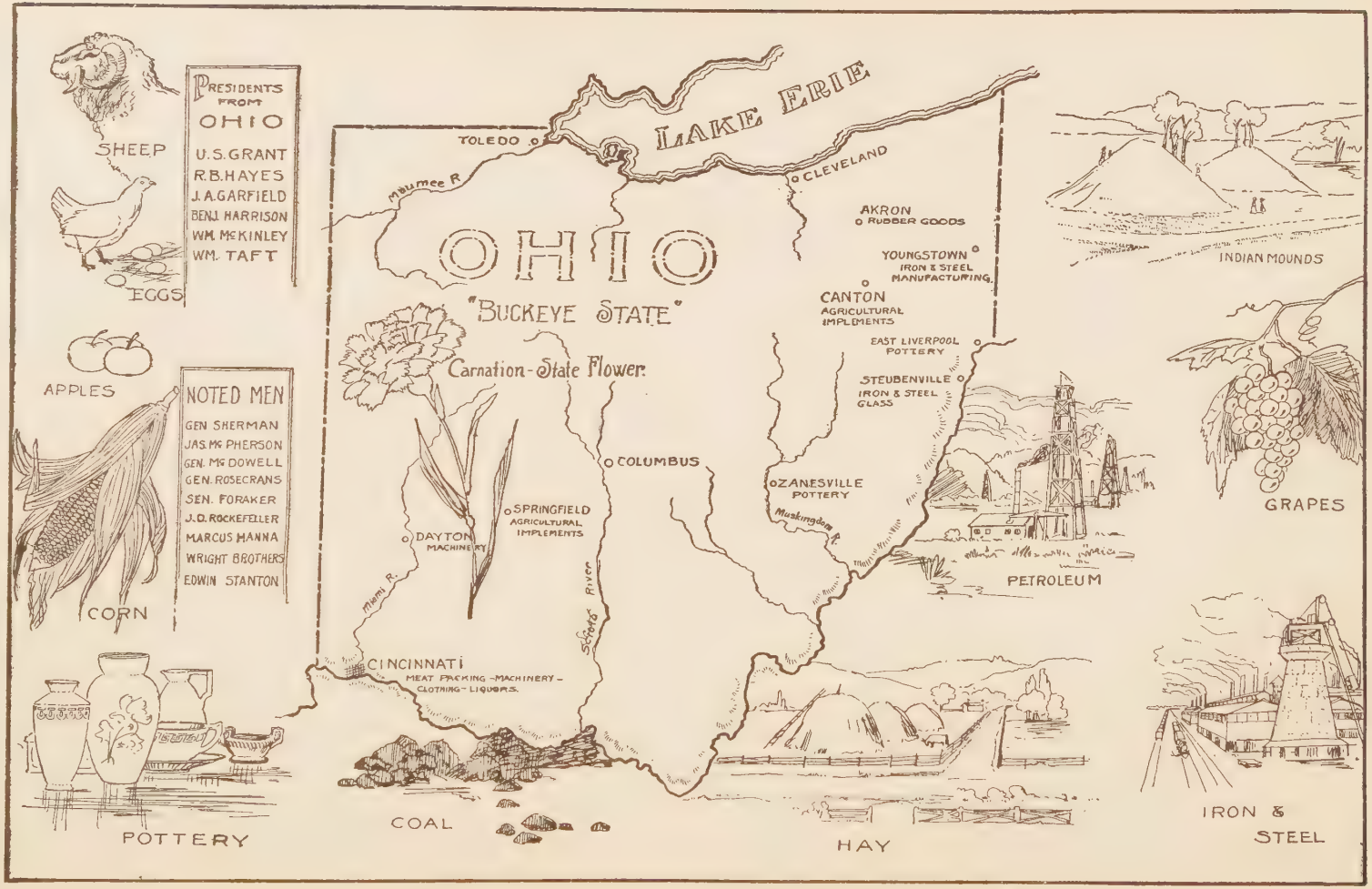
Government.

Education.
1. Public Schools.
2. Higher institutions.
   Ohio State University.
   Miami University.
   Western Reserve University.
   Wesleyan University.
   Oberlin College.

History.
1. Early exploration.
2. First settlement.
3. Ordinance of 1787.
4. Organized as a territory.
5. Admission into the Union.

QUESTIONS.

Why is Ohio called the "Buckeye State"?
What are the chief agricultural products?
Where is the State University located?
What part of the state was formerly known as the "Western Reserve"?


LAKE ERIE
OHIO
"BUCKEYE STATE"
Carnation - State Flower
TOLEDO
CLEVELAND
Maumee R.
AKRON
RUBBER GOODS
YOUNGSTOWN
IRON & STEEL MANUFACTURING
CANTON
AGRICULTURAL IMPLEMENTS
EAST LIVERPOOL
POTTERY
STEUBENVILLE
IRON & STEEL GLASS
COLUMBUS
ZANESVILLE
POTTERY
Muskingum R.
SPRINGFIELD
AGRICULTURAL IMPLEMENTS
DAYTON
MACHINERY
Miami R.
Scioto River
CINCINNATI
MEAT PACKING - MACHINERY - CLOTHING - LIQUORS.
PRESIDENTS FROM OHIO
U.S. GRANT
R.B. HAYES
J.A. GARFIELD
BENJ. HARRISON
WM. McKINLEY
WM. TAFT
SHEEP
EGGS
APPLES
NOTED MEN
GEN. SHERMAN
JAS. Mc PHERSON
GEN. Mc DOWELL
GEN. ROSECRANS
SEN. FORAKER
J.D. ROCKEFELLER
MARCUS HANNA
WRIGHT BROTHERS
EDWIN STANTON
CORN
POTTERY
COAL
HAY
PETROLEUM
INDIAN MOUNDS
GRAPES
IRON & STEEL

Cleveland

"The Forest City."

Location.
1. Position in State.
2. Position in U. S.

Size.
1. Area.
2. Population.
3. Rank.
   a. In State.
   b. In U. S.

Plan.
1. General Outline.
2. Streets.
3. Public Squares.
4. Parks.

Public Buildings.
1. Most important.
2. Churches.
3. Institutions.
4. Libraries, Museums, etc.

Industries.
1. Commerce.
2. Railroad center.
3. Lake traffic.
4. Iron and steel mills.
5. Shipbuilding.
6. Refining petroleum.

History.
1. Early settlement.
2. Origin of name.
3. Influence of canals.
4. Introduction of iron ore.
5. Recent growth.

What are the chief industries of Cleveland?
How did the city receive its name?

Cincinnati

"Queen City."

Situation.
In state.
In United States.

Size.
Area.
Population.

Drainage.
Ohio river.
Mill creek.
Miami canal.

Surface.
Slope.
Hills.
Bluffs.
Irregularity.

Public Buildings.
Most important.
Libraries.
Churches.
Institutions.

Commerce.
Railroads.
Steamships.
River traffic.
Wholesale trade.

Manufacturing.
Slaughtering.
Meat packing.
Pottery works.
Machinery.
Other articles.

History.
First settlement.
Fort Washington.
County seat.
Incorporation.
Under martial law.
Floods.
Later events.

What are the leading industries of Cincinnati?
What effect would the establishing of a deep waterway to the Gulf of Mexico have upon Cincinnati?

Oklahoma

"The Boomer State."

Situation.
- Position.
- Group.
- Latitude.
- Longitude.

Size.
- Length.
- Breadth.
- Area.
- Comparative.

Outline.
- Regular.
- Boundaries.

Surface.
- Plateaus.
- Prairies.
- Hills.
- Valleys.
- Plains.

Drainage.
- Rivers.
- Tributaries.
- Location.

Climate.
- Temperature.
- Characteristics.
- Rainfall.

Mineral Resources.
- Coal.
- Gypsum.
- Granite.
- Petroleum.
- Natural gas.

Agriculture.
- Advantages.
  - Soil.
  - Climate.
  - Rainfall.
- Irrigation.
- Crops.
  - Corn.
  - Wheat.
  - Oats.
  - Cotton.
- Live stock.
  - Cattle.
  - Horses.
  - Mules.
  - Sheep.

Manufactures.
- Development.
- Cotton gins.
- Mills.
- Lumbering.

Indian Reservations.
- Five Nations.
- Government.
- Education.
- Industry.

Population.
- Present.
- Increase.
- Indians.
- Negroes.

Cities.
- Guthrie.
- Oklahoma City.
- Ardmore.
- Enid.

Education.
- Public schools.
- Normals.
- Universities.

History.
- Indian tribes.
- Purchase.
- Settlement.
- Territory.
- Enabling Act.
- Admission.

ITEMS OF INTEREST.

"No Man's Land" is a strip of land which was ceded to the United States by Texas and was included in Oklahoma Territory in 1889.

Oklahoma was originally part of Indian Territory, and was purchased from the Indians in 1889.

The name "Boomer State" was given on account of the great number of people who rushed into Oklahoma when it was opened for settlement and cities were built in a few days.

Oklahoma is the Choctaw name for the Home of the Red Men.

Oklahoma and Indian Territory were united into one state in 1907.

QUESTIONS ON OKLAHOMA.

To what group of states does Oklahoma belong? What states form its boundaries?

What proportion of the area of the state is water?

What portion is known as "No Man's Land"?

How is the surface of the northeastern part of the state different from the central part? The western? The southeastern?

What are the important rivers? What territory do they drain?

What is the climate of this state? What is the average rainfall? In what portion of the state is irrigation essential?

How does the annual output of coal compare with that of Illinois?

What other resources are being developed?

What agricultural advantages has this state?

Name the principal cereal grown. What is the annual output of corn?

What is the annual output of cotton in bales? In pounds?

In what part of the state is live stock principally raised? What domestic animals are raised?

What is known as the cotton region? What industries are found there?
In what part of the state is lumbering carried on?
What is the principal industry of the Indians?
What proportion of the total population is Indian? Colored?
What system of education did Indian Territory have? When were government schools established there?
How are the Indians educated?
How did the enabling act affect the schools?
For what was Oklahoma originally set apart? How were the Indians governed?
When and by what means was this state thrown open to settlement?
What was remarkable about the opening of this territory?
When was the enabling act passed? What did it provide?

Pennsylvania

"The Keystone State."

I. Position.
- In what latitude and longitude is Pennsylvania?
- What other states are in the same latitude?
- How many states form its boundaries?
- How does it rank in size with the other states?

II. Surface.
- How is the surface divided?
- Where is the Piedmont plateau?
- Where is the mountainous region?
- How do the eastern and western slopes of the mountains differ?
- Where is the Alleghany plateau?

III. Drainage.
- What river drains the eastern portion of the state? The northeastern and central parts? The Alleghany plateau?
- What is meant by a "tarn"? Where are they found?

IV. Climate.
- What are the characteristics of the northwest and western parts of the state?
- How do they differ from the mountainous region? From the eastern section?
- What is the difference in rainfall in the western and eastern counties?
- Where is the heaviest snowfall? How does it affect the rivers?

V. Resources.
- What is the principal mineral found? In what districts is it located?
- Where are the bituminous coal mines found?
- How does Pennsylvania rank in production of coal?
- What other minerals are found between the seams of coal?
- Does any other state exceed it in production of oil?

VI. Agriculture.
- What proportion of the state is devoted to agriculture?
- Where is the most fertile soil found?
- How does farming in Pennsylvania differ from that of Michigan?
- In the production of what grain does Pennsylvania take first place?
- Name another valuable branch of industry.

VII. Population.
- How does Pennsylvania compare with other states in population?
- What other state has a larger population?
- What per cent of the total population is colored?
- What is the population to the square mile?

VIII. MANUFACTURING.

How do the manufactures of Pennsylvania compare with its mining?
What are some of the principal manufactures?
When was the first blast furnace opened? By whom?
Name six manufactures in which Pennsylvania ranks first.
What industry ranks second?

IX. COMMERCE.

For what are the canals principally used?
What are the chief railroad centers?
What are the important exports? Imports?

X. HISTORY.

When was the first permanent settlement made?
To what countries did Pennsylvania belong?
Why was it called Pennsylvania?
What position did it take in the French and Indian war?
What part did it play in the Revolutionary war?
What side did it favor in the Civil war?
How many years ago did it become a separate state?

ITEMS OF INTEREST.

Pennsylvania ranks twenty-ninth in size in the United States.
The output of coal exceeds in value the total mineral product of any other state.
Sixty-seven per cent of the area of Pennsylvania is devoted to farming.
Pennsylvania ranks second in population.
One-half of the Portland cement produced in the United States is obtained in Pennsylvania.
The origin of the name Pennsylvania is Latin and means "Penn's Woody Land."
The state motto is "Virtue, Liberty, Independence."
Erie is the only lake port in Pennsylvania.
Pennsylvania ranks first in slate, lime and coal.
The Delaware Water Gap on the eastern boundary of Pennsylvania, through which the Delaware River flows, forms some of the most picturesque scenery in the United States.
Pittsburg contains the greatest number and variety of factories in the world, and contains the largest ax factory in the world.
Pittsburg ranks first in iron and steel industry in the United States, and is the greatest oil market in the world.
Pittsburg manufactures more glassware than any other city in the United States.
The first oil well in the United States was bored at Titusville, in 1859.
Pottsville contains the deepest coal mine in America.
Pennsylvania is sometimes called the "Black Diamond State" on account of its coal mines.
Pennsylvania has an important network of canals, canalized rivers and railways.

Philadelphia

"The Quaker City."

DESCRIPTION.
- Location.
- Size.
- Population.

HOMES.
- Size.
- Number.
- Architecture.

PARKS.
- Squares.
- Fairmount park.
  - Divisions.
  - Rivers.
  - Zoological Gardens.

COMMERCE AND INDUSTRY.
- Foreign.
- Domestic.
- Extent.
- Docks.
- Manufactures.

Importance.
Extent.
Shipbuilding.
Locomotive Works.
HISTORICAL ITEMS.
Penn's Cottage.
Home of Robert Morris.
Carpenter's Hall.
Independence Hall.
Old Liberty Bell.
Betsy Ross House.
PUBLIC BUILDINGS.
City Hall.
Federal Buildings.
U. S. Mint.
Postoffice.
Customhouse.
Arsenal.
Office buildings.
Theaters.
Churches.
Charitable Institutions.
Universities and Colleges.
HISTORY.
First settlement.
English settlement.
Chartered.
Revolutionary center.
National Capital.
Prominence.

ITEMS OF INTEREST.

Philadelphia is the center of the greatest carpet manufactures in the United States.

Near Philadelphia are the largest and most important shipbuilding yards in the United States.

Philadelphia is one of the most important manufacturing cities of the country.

Philadelphia still retains many of its old customs, houses and laws, probably to a greater extent than any other city.

Philadelphia was the capital of the United States for ten years.

Independence Hall, in this city, has been called the "Mecca of American Freemen" as it was here the Declaration of Independence was written and signed.

Philadelphia is known as the "City of Homes" on account of the large number of small homes found in it.

The first United States mint was established in this city.

Philadelphia leads in the manufacture of hosiery and export of coal.

The first American flag was made in Philadelphia.

The Bank of North America in Philadelphia is the oldest in the United States.

The First and Second Continental Congress assembled in Carpenter's Hall.

The Baldwin Locomotive Works in this city are the largest in the world.

QUESTIONS.

By what rivers is this city drained?

What is characteristic of the homes in Philadelphia? What is the general effect?

By what three names is this city called? How is each name appropriate?

By whom was the first brick house in Philadelphia erected? Where does it now stand?

The home of what American patriot now stands on Lemon street?

For what is Carpenter's Hall noted? Independence Hall?

Where was the first American flag made? By whom?

Name three other buildings famous in revolutionary times which are still preserved.

Describe the "public building." Into what departments is it divided?

What do the Federal buildings comprise?

Name three important educational institutions found in this city.

What other cities have more commerce and industry?

In what manufactures does this city lead?

For what part of the country is it a distributing point?

What was this city first called? When was it changed?

What part did this city take in the Revolutionary War?

In what three ways was it the most important city for many years?

Texas

"The Lone Star State."

Location.
1. Latitude.
2. Longitude.
3. Position in the U. S.
4. Boundaries.

Size.
1. Length from north to south.
2. Length from east to west.
3. Area.
4. Relative size.

Surface.
1. Coastal plain.
2. Grand Prairie.
3. The Staked Plain.
4. Mountainous region.

Drainage.
1. Drainage district.
2. Principal rivers.
   - Canadian.
   - Red.
   - Sabine.
   - Trinity.
   - Brazos.
   - Colorado.
   - Nueces.
   - Rio Grande.

Climate.
1. Temperature.
2. Rainfall.
3. Healthfulness.

Mineral Resources.
1. Petroleum.
2. Coal.
3. Building stone.
4. Other minerals.

Agriculture.
1. Oats
2. Rice.
3. Sugar.
4. Livestock.
5. Fruits.
6. Vegetables.

Manufactures.
1. Lumber.
2. Cottonseed oil.
3. Canning fruits and vegetables.

Cities.
1. Austin.
2. Dallas.
3. Fort Worth.
4. Galveston.
5. Houston.
6. San Antonio.

Government.

Education.
1. Public schools.
2. Higher institutions.
   - University of Texas.
   - State Normal Schools.
   - State Agricultural College.
   - Other colleges and universities.

History.
1. Early explorations.
2. First settlements.
   - French.
   - Spanish.
3. Republic organized.
4. Annexed to the United States.
5. Admitted to the Union.
6. Part in the Civil War.
7. Recent developments.

QUESTIONS.

What European countries are of nearly the same area as Texas?

If Texas were populated as densely as Belgium, how many inhabitants would the state have?

Why is Texas called the *Lone Star State?*

In what part of Texas is the Great Prairie Region?

What are the Staked Plains? Why are they so called?

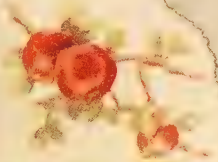
TEXAS

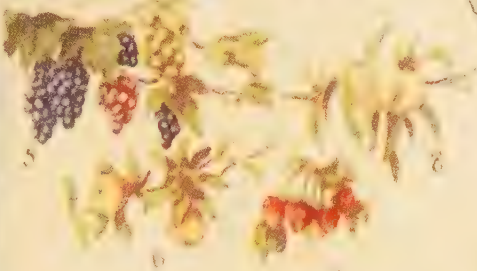
THE LONE STAR STATE

HISTORY
EXPLORED 1528
SETTLED 1685
INDEPENDENT 1836
MADE STATE 1845

GEOGRAPHY
AREA 265,780 SQUARE MILES
EQUAL TO 3/3 OF MASSACHUSETTS
LENGTH EAST TO WEST 740 MILES
LENGTH NORTH TO SOUTH 760 MILES
RANK IN THE UNION
FIRST IN THE PRODUCTION OF COTTON & LIVESTOCK
SECOND IN THE PRODUCTION OF SUGAR AND RICE

INDUSTRIES
STOCK RAISING, AGRICULTURE
HORTICULTURE
PRODUCTION OF PETROLEUM





1, Rice.
2, Cattle and Swine.
3, Sheep.
4, Apples.
5, Grapes.
6, Pears.
7, Strawberries.
8, Peaches.
9, Rice Field.
10, Sugar Cane.
11, Cotton Field.
12, Vegetables.
13, Oil Well.
14, Corn.
15, Draft Horses.
16, Oats.

What does the color plate tell you about the products and industries of Texas?
How does Texas differ in her history from any other state in the Union?
What relation did Texas sustain to the Mexican War?
What is the Alamo? Why is it famous?
How does Texas compare with other states in the production of petroleum?
Why is truck gardening so profitable in Texas?
What are the other important agricultural products?
What are the five most important cities of the state?
What are the chief railway centers?
What is the "Panhandle"? Can you see why it should be given that name?
What are the most important towns on the Mexican border?
What railway lines leading to California pass through Texas?

Galveston

SITUATION.
POPULATION.
COMMERCE.
- Railroads.
- Steamships.
- Wharf.
- Exports.
  - Rank.
  - Articles.

INDUSTRIES.
- Manufactures.
- Ice Plants.
- Iron Works.
- Mills.
  - Flour.
  - Rice.
  - Cotton Seed Oil.

HISTORY.
- First settlement.
- Incorporation.
- Later events.
  - Great fire.
  - Flood.
- Sea Wall.

FACTS ABOUT GALVESTON.

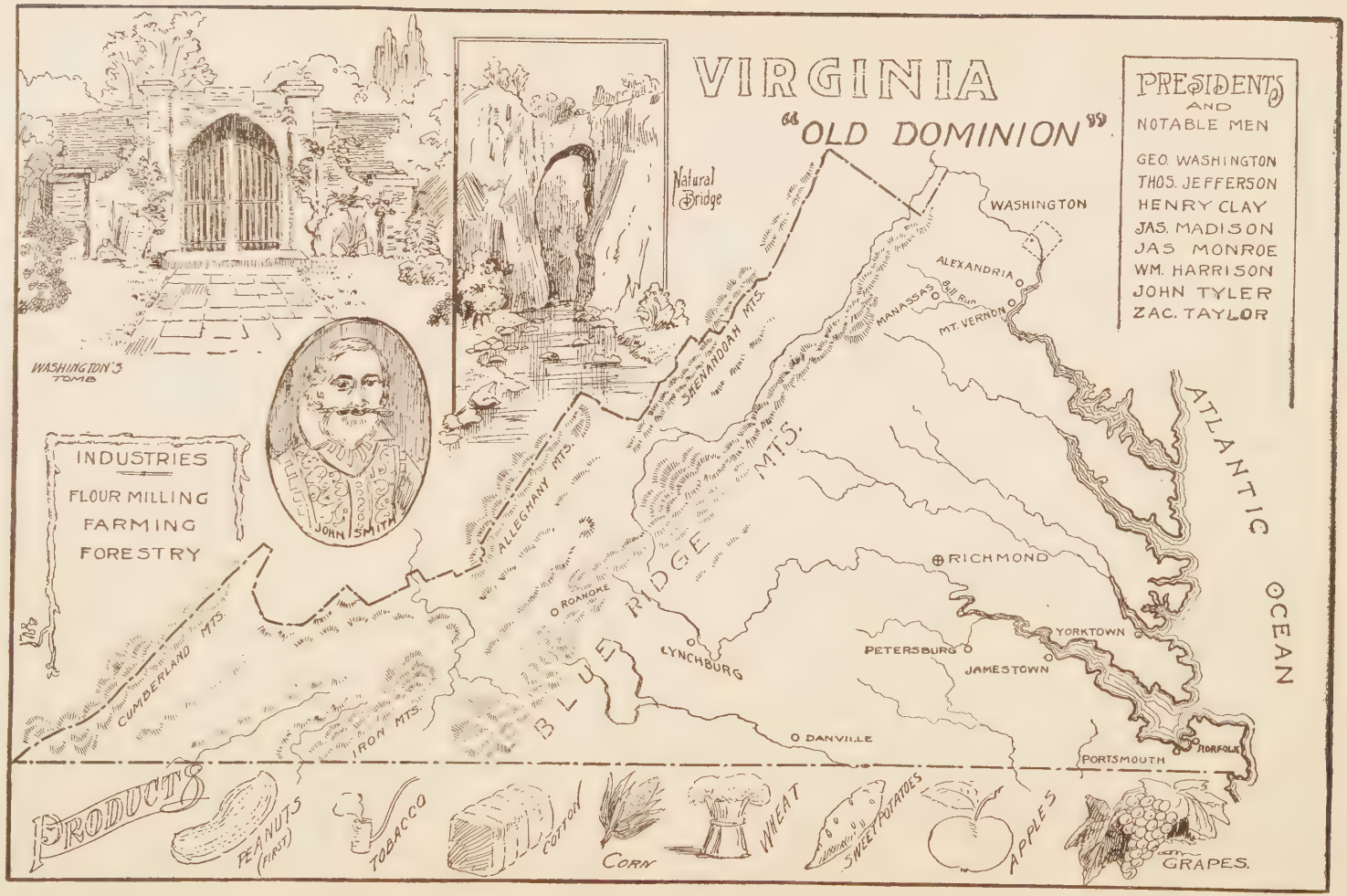
Galveston is the most important seaport of Texas and is situated on Galveston Island at the opening of Galveston Bay.

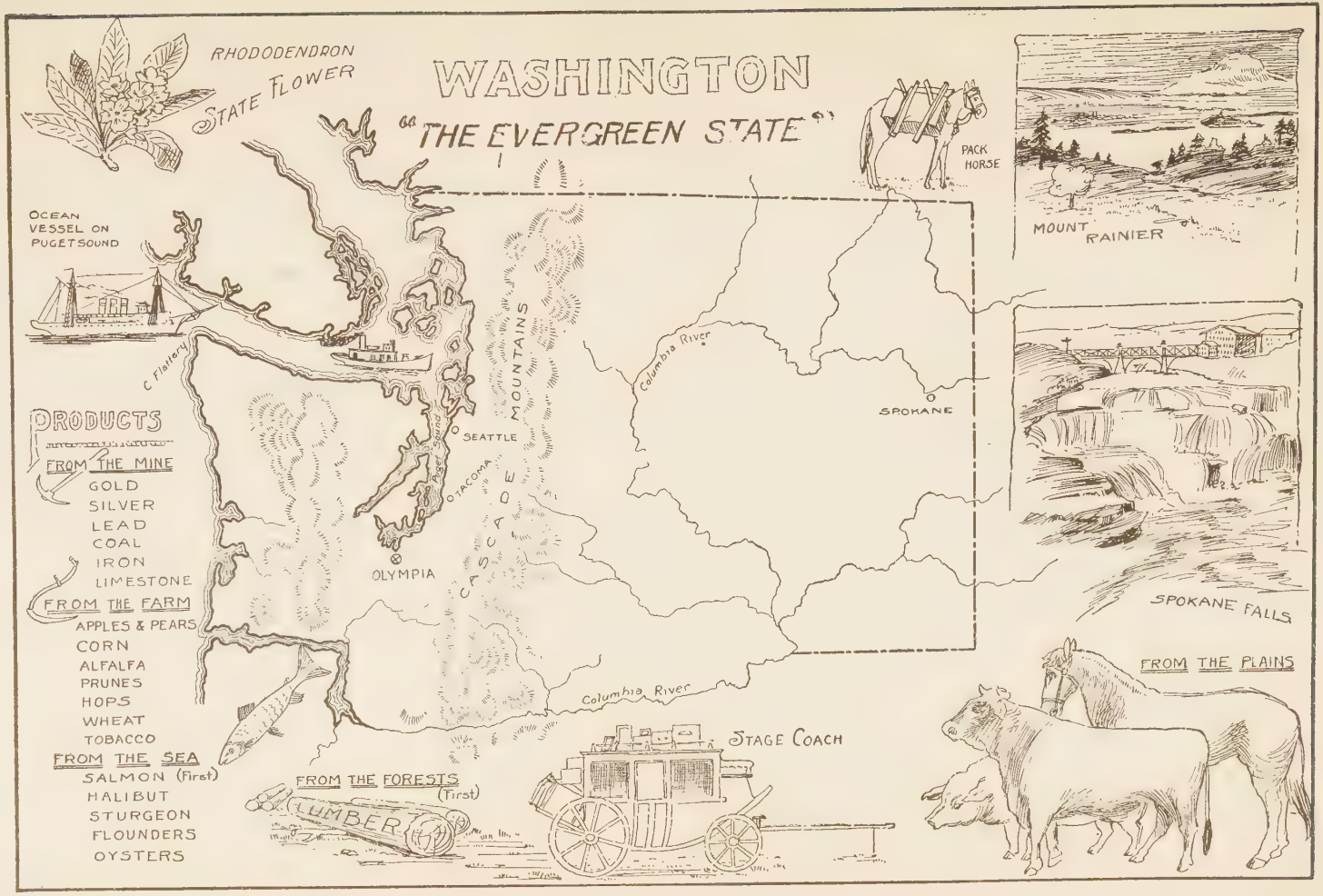
Chief among its industries is its commerce and next in importance is cotton pressing and the manufacture of oil and flour.

This city is only about five feet above sea level and to protect it from being submerged, a great wall has been erected at large expense.

QUESTIONS.

On what is the city of Galveston situated?
What improvement has been made in the channel? Of what benefit is this?
Name five of the principal industries in this city.
What articles are manufactured?
What advance has this city made in its export trade? How does it now rank?
Of what important product is Galveston the chief exporting point?
What was the cause of the great flood in this city? What damage did it do?
How is the city now protected?
How does the population of Galveston compare with that of New Orleans?
Name six articles, besides cotton, which are exported to other countries.


VIRGINIA
"OLD DOMINION"
PRESIDENTS AND NOTABLE MEN
GEO. WASHINGTON
THOS. JEFFERSON
HENRY CLAY
JAS. MADISON
JAS MONROE
WM. HARRISON
JOHN TYLER
ZAC. TAYLOR
Natural Bridge
WASHINGTON'S TOMB
JOHN SMITH
INDUSTRIES
FLOUR MILLING
FARMING
FORESTRY
WASHINGTON
ALEXANDRIA
MANASSAS
Bull Run
MT. VERNON
SHENANDOAH MTS.
ALLEGHANY MTS.
BLUE RIDGE MTS.
ATLANTIC OCEAN
RICHMOND
ROANOKE
LYNCHBURG
PETERSBURG
YORKTOWN
JAMESTOWN
DANVILLE
PORTSMOUTH
NORFOLK
CUMBERLAND MTS.
IRON MTS.
PRODUCTS
PEANUTS (FIRST)
TOBACCO
COTTON
CORN
WHEAT
SWEET POTATOES
APPLES
GRAPES.


RHODODENDRON
STATE FLOWER
WASHINGTON
"THE EVERGREEN STATE"
PACK HORSE
MOUNT RAINIER
OCEAN VESSEL ON PUGETSOUND
C. Flattery
PRODUCTS
FROM THE MINE
GOLD
SILVER
LEAD
COAL
IRON
LIMESTONE
FROM THE FARM
APPLES & PEARS
CORN
ALFALFA
PRUNES
HOPS
WHEAT
TOBACCO
FROM THE SEA
SALMON (First)
HALIBUT
STURGEON
FLOUNDERS
OYSTERS
Puget Sound
SEATTLE
TACOMA
OLYMPIA
CASCADE MOUNTAINS
Columbia River
SPOKANE
SPOKANE FALLS
Columbia River
FROM THE FORESTS (First)
LUMBER
STAGE COACH
FROM THE PLAINS

Wisconsin

"The Badger State."

Position.
- Group.
- Boundaries.

Size.
- Area.
- Length.
- Breadth.
- Comparative.

Surface.
- Character.
- Plains.
- Elevations.
- Altitude.
- Ridges.
- Bluffs.

Drainage.
- Divisions.
- Rivers.
- Lakes.
- Water shed.

Climate.
- Seasons.
- Snowfall.
- Rainfall.

Minerals.
- Products.
- Location.
- Uses.
- Value.

Agriculture.
- Soil.
- Forests.
- Dairying.
- Crops.

Manufacturing.
- Variety.
- Development.
- Extent.
- Value.

Transportation.
- Lakes.
- Canals.
- Railroads.

Commerce.
- Extent.
- Exports.
- Imports.
- Trade centers.

Population.
- Relative.
- Comparative.
- Square mile.

Education.
- Expenditure.
- Schools.
- State schools.
- Universities.
- Institutions.

Cities.
- Madison.
- Milwaukee.
- Superior.
- Oshkosh.
- Racine.
- Green Bay.
- Fond du Lac.

History.
- Explorers.
- Missions.
- Treaty of Paris.
- Territorial.
- Admission.
- Civil war.
- Progress.

ITEMS OF INTEREST.

Wisconsin is an Indian word meaning "Wild Rushing Waters."

Wisconsin ranks second in production of zinc ore and third in mineral waters and lime.

Bayfield, Wis., is known as "The Village of Fountains," as almost every house has a natural fountain, caused by springs on the hills overlooking the village.

Milwaukee is called the "Cream City."

Madison is called the "Lake City" on account of its situation on four lakes.

Racine is noted for the manufacture of threshing machines.

The largest charcoal blast furnace in the world is at Ashland, Wis.

West Superior is noted for the building of ships, also for the largest system of connected grain elevators in the world.

Chippewa Falls contains one of the largest saw mills in the world.

Wisconsin leads in the production of hops.

QUESTIONS ON WISCONSIN.

What position does Wisconsin occupy in the United States?

What are its natural boundaries? Artificial?

What proportion of the area of the state is water?

What is the approximate population to the square mile?

What is the general character of the surface?

Where is the highest altitude? Lowest? What forms the water sheds?

What drains the northwestern part of this state?

What proportion of the state is drained into the Mississippi river?

Washington

"The City of Magnificent Distances."

- Description.
  - Location.
  - Area.
  - Population.
  - Plan of city.
    - Central point.
    - Direction of street.
    - Sections.
- Parks.
  - Capitol Hill.
    - Description.
    - Size.
    - Situation.
  - Executive grounds.
  - Lafayette square.
  - The Mall.
- Commerce and Industry.
  - How controlled?
  - How affected?
  - Extent.
  - Retail trade.
- Educational Institutions.
  - School system.
    - Organization.
  - Universities.
  - Scientific bureaus.
  - Institutions.
- Government.
  - How unique?
  - How controlled?
- Public Buildings.
  - Capitol.
    - Departments.
    - Famous doors.
    - Interior.
  - White House.
    - Architecture.
    - Gardens.
    - Interior.
  - Congressional Library.
    - Size.
    - Number of books.
    - Architecture.
    - Interior.
  - Department of Agriculture.
  - Bureau of Engraving and Printing.
  - Treasury building.
  - State, War and Navy building.
  - Government printing office.
  - Pension office.
  - Interior department.
  - National Museum.
  - Smithsonian Institution.
  - Corcoran Art Gallery.
- History.
  - Distinction.
  - Planned by L'Enfant.
  - Burned by British.
  - Rebuilt.
  - Later changes.

INTERESTING ITEMS.

Washington is the only city in the world designed especially for the capital of a nation.

The site of Washington was selected by General Washington. Charles L'Enfant, a French engineer, drew the plans for the entire city.

The public schools in Washington were organized by a board of trustees, of which Thomas Jefferson was the fifth president.

Washington is well named "The City of Magnificent Distances," for its system of streets, avenues, parks and vistas eclipse any other city in the world.

The Congressional Library building is the grandest library building in the world.

The Washington Monument, which is about a mile from the capitol building, is the highest in the world and is called "the world's greatest cenotaph."

QUESTIONS.

What is unique about the plan of this city? Around what does it center?

Traveling at the rate of forty miles an hour, how much longer would it take you to go from Washington to Chicago than it would from Washington to New York?

What is the Mall? To what does it lead?

By whom were the doors of the east entrance made? What do they depict?

Where is the library of congress? How does it compare in number of books and beauty of building with other libraries in the United States? In the world?

What is unique about the government of this city?

What fact influences its trade and commerce? When is this most noticeable?

What prominent men were connected with the founding of the city?

When and by whom was this city almost demolished? What checked it?

Yellowstone Park

I. Situation.
  In state.
  In United States.
II. Size.
  Length.
  Breadth.
  Total area.
III. Surface.
  Volcanic.
  Irregular.
  Continental Divide.
  Mountains.
    Absarokas.
    Snowy Mts.
    Gallatin Range.
    Tetons.
  Valleys.
    Junction.
    Hayden.
    Madison.
IV. Rivers.
  Systems.
    Yellowstone.
    Missouri.
    Snake.
  Characteristics.
  Canyons.
    Golden Gate.
    Gibbon.
    Gardiner.
    Yellowstone.
V. Falls.
  Number.
  Beauty.
  Principal ones.
    Gibbon Falls.
    Kepler Cascade.
    Osprey Falls.
    Tower Falls.
    Falls of the Yellowstone.
VI. Lakes.
  Yellowstone.
    Size.
    Altitude.
    Distinction.
  Shoshone.
  Louis.
  Jackson.
VII. Hot Springs.
  Number.
  Temperature.
  Coloring.
  Mammoth Hot Springs.
    Terraces.
    Formation.
    Area.
    Altitude.
    Coloring.
  Turquois Spring.
  Prismatic Lake.
  Morning Glory.
  Emerald.
  Sapphire.
  Punch Bowl.
  Paint Pots.
VIII. Geysers.
  Classes.
  Difference.
  Geyser region.
  Fountain geysers.
  Old Faithful.
  Beehive.
  Giant.
  Giantess.
  Castle.
  Riverside.
IX. Forests.
  Extent.
  Trees.
  Animals.
  Roads.
X. Interesting Items.
  Obsidian Cliff.
  Mud geysers.
  Roaring Mountain.
  Fumeroles.

QUESTIONS ON YELLOWSTONE PARK.

For what is Yellowstone Park noted?

When was it made a national park? By whom?

In what state does it lie? What portions of its territory belonged to other states?

What is the character of the surface in the central part? By what is it bordered?

What tends to give diversity to the scenery?
What and where is the Continental Divide?
Where is Two Ocean Plateau? Why so called?
Name four ways by which the rivers are characterized?
What canyon in this park is considered the most beautiful in the world? Name some of its beauties.
Name some of the waterfalls found in this park. Which is the largest and most beautiful?
How does the altitude of Yellowstone lake compare with that of other lakes?
For what is The Thumb noted?
In what localities are hot springs most numerous? Describe some of them and name their peculiarities.
For what are the Mammoth Springs noted? What has caused their peculiar formation?
How does the number of springs compare with the number of geysers?
Where do most of the geysers occur? What causes the eruption of a geyser?
What two classes of geysers are found in this park?
How does the eruption of the Giant compare with that of Old Faithful?
Describe Obsidian Cliff and Roaring Mountain.
What are Fumeroles? Where do they occur?
What animals are found in this park? How are they protected?
How many days does it usually take to make a trip through this park?
When is the best time to visit it?

Mammoth Cave

I. Location.
  State.
  Section.
II. Size.
  Diameter.
  Area.
  Length.
  Width.
  Height.
III. Formation.
  Main cave.
    Size.
    Chief City.
    Star Chamber.
    Description.
      Caverns.
      Levels.
      Passageways.
      Mineral deposits.
IV. Rivers.
  Principal ones.
  Size.
  How named.
V. Curiosities.
  Blind fish.
  Blind grasshoppers.
  Blind insects.

QUESTIONS.

How does Mammoth Cave compare in size with other caves in the world?
In what state is it situated? Near what river?
How many miles in diameter?
How far have the passageways been explored?
How large is the main cave? How is it divided?
How does the size of the Chief City compare with that of the main cave?
Describe the Star Chamber. Why so called?
How did Echo river get its name?
How is the altitude divided? To what do they lead?
How do you account for the fish and other animals being blind?
In what year was this cave discovered?
What connection did it have with the war of 1812?

Divisions of Geography

I. Mathematical Geography.
- 1. Form.
- 2. Size.
- 3. Motions.
- 4. Measurements.
- 5. Longitude and Latitude.
- 6. Zones.
- 7. Map.
- 8. International Date Line.

II. Physical Geography.
- 1. Land.
  - a. Continent.
  - b. Island.
  - c. Cape.
  - d. Peninsula.
  - e. Isthmus.
  - f. Mountain.
    - Range.
    - System.
    - Volcano.
  - g. Valley.
  - h. Plain.
  - i. Plateau.
- 2. Water.
  - a. Hydrography.
  - b. Ocean.
  - c. Gulf or Bay.
  - d. Strait.
  - e. Movements.
    - Currents.
    - Tides.
    - Waves.
  - f. River.
  - g. Lake.
- 3. Atmosphere.
  - a. Wind (map).
    - Chinook.
    - Monsoon.
    - Sirocco.
    - Kamsin.
  - b. Rainfall.
  - c. Storms.
    - Tornado.
    - Cyclone.
    - Hurricane.
  - d. Weather Bureau (map).
  - e. Relation of climate to life.

III. Political Geography.
- 1. Grand Divisions.
  - (See outline Africa.)
- 2. Countries.
  - (See outline United States.)
- 3. Minor political divisions.
  - (See outline California.)
- 4. Cities.
  - (See outline Boston.)
- 5. Forms of Government.
- 6. Religion.
- 7. Institutions.

IV. Economic Geography.
- 1. Industries.
- 2. Commerce.
- 3. Manufactures.
- 4. Agriculture.
- 5. Mining.

Pacific Ocean

Boundaries.	Size.	Islands.	Trade Winds.
North.	Compared with Atlantic.	Single.	Direction.
East.	All the continents.	Groups.	Duration.
South.	Lake Superior.		Names of.
West.	Your own state.		

TEST QUESTIONS ON THE PACIFIC OCEAN.

Who discovered the Pacific? When? What was its former name?

How does the size of the Pacific compare with that of the four continents? With North America? With the Atlantic?

What part of the earth's surface is occupied by this ocean?

Name and locate three important groups of islands.

In sailing from San Francisco to Manila, which island port would you visit? What distance is this from Manila?

Name six of the principal seas connecting with it.

If Mt. Everest were set down in the deepest part of it, how many feet of water would cover its summit?

What is the difference in the tides of the Pacific and Atlantic?

Why are the trade winds of the Pacific irregular?

Describe a typhoon. Trade winds.

Who were the first Europeans to enter the Pacific?

Name some countries and cities touched by the Pacific Ocean which late events have given importance.

Table showing a comparison of the countries of South America with themselves, with Germany, with our own country and with Illinois.

Similar outlines can easily and readily be made by teacher or pupil on other continents, on countries, states, etc.

Country.	Area in square miles.	Population in round numbers.	Population per square mile.	Miles of railroads.	Principal products. Name five of each country.
Germany	208,000	56,000,000	270	35,000	
United States..	3,000,000	76,000,000	25	299,000	
Illinois	56,000	5,000,000	90	12,000	
Argentina	1,113,000	4,800,000	4	11,460	
Bolivia	734,000	1,800,000	2	700	
Brazil	3,200,000	18,000,000	5	10,480	
Chile	280,000	3,100,000	11	2,880	
Colombia	504,000	3,900,000	7	500	
Ecuador	116,000	1,200,000	10	186	
Guiana, British.	109,000	300,000	2	104	
Guiana, Dutch.	46,000	67,000	1	...	
Guiana, French.	30,000	30,000	1	...	
Paraguay	157,000	600,000	3	156	
Peru	695,000	4,600,000	6	1,146	
Uruguay	72,000	2,400,000	12	1,210	
Venezuela	593,000	930,000	4	634	

TEST QUESTIONS.

How does the size and population of French Guiana compare with your own county? What percentage of Guiana's population are convicts?

If Brazil's population should suddenly increase five times how would it compare with that of the United States? Which has the larger area?

Which has more miles of railroad, Brazil or Illinois? Brazil or your own state?

If Illinois were no more thickly populated than Bolivia what would be its population?

How many South American countries have a smaller population than New York City? Than Boston? Than Seattle?

What products and industries of certain South American countries are common to your neighborhood?

Two-thirds of the world's supply of coffee comes from what country of South America?

Why are there so few railroads in Bolivia?

Were you to take a trip through Venezuela, what products would you see?

What countries are crossed by the equator?

For how many thousand miles is the Amazon and its tributaries navigable? How wide is it near its mouth?

What wild animals would you find in the Amazon country?

Which has the colder climate, Buenos Ayres or Chicago?

Where would you find whole armies of monkeys?

Which is the larger, Great Salt Lake or Lake Titicaca? At what great altitude is the latter located?

In what mountain range of South America are found the second highest peaks in the world?

In what countries are there no railroads?

From page illustrating animals of South America, what would you say are the chief uses of the alpaca? Of what bird in Africa does the rhea remind you? Which is the larger?

In what respect would you find the farms of Argentina similar to those of North Dakota?

With what language should you be familiar to understand and be understood in Montevideo? In Rio Janeiro? In Valparaiso?

Are there any monarchies in South America? What is the prevailing form of government?

Which would be the shady side of a street running east and west at midday in Valparaiso?

Why would you find no shade on either side of a street running east and west in Quito?

In what direction would you look to see the sun at Buenos Ayres?

Methods of Teaching Geography

I. Purposes of Teacher.
   1. To give knowledge.
      a. Immediate surroundings; why?
         Plants.
         Animals.
         Occupations, etc., etc.
      b. Principles and laws of geography.
         Climatic effects.
         Distribution of life; results?
      c. Application of laws.
         Determining what conditions?
      d. Observing these conditions.
         Control human activities; how? when?

II. Preparation of Teacher.
   1. Knowledge of what principles? Ability to apply how?
   2. Knowledge of what facts? Specific and general?
   3. Knowledge of methods of teaching.

III. Aids to Teacher's Preparation.
1. Study of what works?
2. Study of what related sciences?
3. Supplementary reading; what? object?
4. Observation; when, where and how?

IV. Equipment.
1. Collections of what? For what? How used?
2. Scrap cabinet. Consists of what? Purpose?
3. Miscellaneous. Individual ideas.

V. Grades.
1. Primary.
a. Nature study.
What subjects?
How presented?
b. Facts and geographical conditions.
Observation. What? How? Where?
c. Towns.
Occupations. What? Why?
Transportation. What? Why?
d. Maps. What? How presented?
e. Travel.
Imaginary journeys; object?
Extending ideas; known to unknown.
2. Intermediate.
a. Text-book; adjustment of mind.
b. Maps; of what? proportions?
3. Grammar.
a. Advanced text-book; how used?
b. Reference work, etc.

VI. General Aids, All Grades.
1. Study of type. How? What?
a. Comparisons.

Forms or outlines.	Races of men.
Distances.	Animals.
Surfaces.	Occupations.
Drainage.	Civilization.
Climate.	Growth and decline.

Guard well your spare moments. They are like uncut diamonds. Discard them and their value will never be known; improve them and they will become the brightest gems in a useful life.

Every book is a good book that sets the reader in a working mood. The deep book, no matter how remote the subject, helps us best. —*Emerson.*

HORSES
ILL. 1,591,000
IOWA 1,419,000
TEX. 1,278,000
KAN. 1,108,000
SWINE
IOWA 8,413,000
ILL. 4,672,000
NEB. 4,243,000
MO. 3,593,000
SHEEP
WYO. 5,885,000
MONT. 5,524,000
N.MEX. 4,787,000
IDAHO 3,575,000
MULES
TEXAS 637,000
MO. 321,000
TENN. 284,000
MISS. 279,000
MILCH COWS
N.Y. 1,789,000
IOWA 1,555,000
WIS. 1,392,000
ILL. 1,184,000
CATTLE
TEX. 7,825,000
IOWA 3,881,000
KAN. 3,577,000
NEB. 3,265,000
N.C. GRAY.

Minerals

Gold.	
1. Colorado	$20,897,600
2. Alaska	18,489,400
3. California	16,853,500
4. Nevada	15,411,000
5. Utah	5,121,600

Silver.	Ounces.
1. Colorado	11,495,400
2. Utah	11,406,900
3. Montana	11,129,600
4. Nevada	8,280,500
5. Idaho	7,888,400

Copper.	Pounds.
1. Arizona	256,778,437
2. Montana	224,263,789
3. Michigan	219,131,503
4. Utah	66,418,370
5. California	33,748,375

Iron.	Long Tons.
1. Minnesota	25,364,077
2. Michigan	11,822,874
3. Alabama	3,995,098
4. Virginia	1,041,992
5. Tennessee	949,429

Zinc.	Short Tons.
1. Missouri	141,824
2. Colorado	26,077
3. Wisconsin	15,273
4. Kansas	13,850
5. New Jersey	13,573

Lead.	Short Tons.
1. Missouri	122,856
2. Idaho	112,569
3. Utah	61,699
4. Colorado	48,876
5. Nevada	3,380

Coal.	Short Tons.
1. Pennsylvania.	
Anthracite (long)	76,432,421
Bituminous	150,143,177
2. Illinois.	
Bituminous	51,317,146
3. West Virginia	48,091,583
4. Ohio	32,142,419
5. Indiana	13,985,713

Coke.	Short Tons.
1. Pennsylvania	23,060,511
2. West Virginia	3,713,514
3. Alabama	3,034,511
4. Virginia	1,577,659
5. Colorado	1,455,905

Petroleum.	Barrels.
1. Oklahoma	43,524,120
2. California	39,748,375
3. Illinois	24,281,973
4. Texas	12,322,696
5. Ohio	12,207,448

Natural Gas.	
1. Pennsylvania	$18,844,156
2. West Virginia	16,670,692
3. Ohio	8,718,652
4. Kansas	4,843,019
5. Indiana	1,572,605

Marble.	
1. Vermont	$ 4,576,000
2. Georgia	919,356
3. Tennessee	635,000
4. New York	557,000
5. Massachusetts	271,000

Slate.	
1. Pennsylvania	$ 3,855,640
2. Vermont	1,477,259
3. Maine	236,606
4. Virginia	173,670
5. Maryland	116,060

Stone.	
1. Pennsylvania	$ 9,132,372
2. Vermont	7,313,739
3. New York	6,993,705
4. Ohio	5,157,970
5. Illinois	3,789,342

Mica.	
1. North Carolina	$ 225,206
2. South Carolina	13,935
3. New Hampshire	7,227
4. Virginia	1,014
5. South Dakota	644

Lime.	Short Tons.
1. Pennsylvania	655,166
2. Ohio	322,917
3. Wisconsin	219,644
4. Missouri	190,300
5. New York	137,111

Quick Silver.	Flasks.
1. California	17,431
2. Texas	3,686
3. Utah	460

Oregon has produced in the past.

Clay Products.	
1. Ohio	$30,340,830
2. Pennsylvania	20,291,621
3. New Jersey	16,005,460
4. Illinois	13,220,489
5. New York	11,772,874

Glass-Sand.	Short Tons.
1. Pennsylvania	370,977
2. Illinois	235,716
3. Missouri	138,483
4. Ohio	95,449
5. New Jersey	87,140

Salt.	Barrels.
1. Michigan	10,786,630
2. New York	9,642,178
3. Ohio	3,851,243
4. Kansas	2,667,459
5. Louisiana	1,157,621

Borax.

Three counties of California produce all the Borax in the United States. 58,173 short tons..... $ 1,182,410

Gypsum.	
1. New York	$ 800,225
2. Iowa	730,383
3. Michigan	681,351
4. Kansas	414,266
5. California	141,675

Tin.	
1. Alaska	A few tons.
2. South Dakota	3,750 lbs.

Portland Cement.	Barrels.
1. Pennsylvania	20,393,965
2. New Jersey	4,449,896
3. Indiana	3,782,841
4. Michigan	3,572,668
5. Kansas	3,353,925

Graphite.	
1. Alabama	$ 54,000
2. Pennsylvania	51,000

Phosphate Rock.	Long Tons.
1. Florida	1,357,365
2. Tennessee	638,612
3. South Carolina	257,221

Mineral Water.	Gallons.
1. Minnesota	9,654,030
2. New York	7,176,815
3. Wisconsin	6,839,219
4. Massachusetts	4,661,115
5. Virginia	2,442,075

Our National Granary

Barley.	Bushels.
Minnesota	32,500,000
California	25,427,000
Wisconsin	24,750,000
South Dakota	24,592,000
North Dakota	18,330,000

Buckwheat.	Bushels.
New York	6,827,000
Pennsylvania	4,992,000
Michigan	742,000
Maine	690,000
West Virginia	378,000

Corn.	Bushels.
Illinois	298,620,000
Iowa	287,456,000
Nebraska	205,767,000
Missouri	203,634,000
Texas	201,848,000

Cotton.	Bales.
Texas	3,917,000
Georgia	1,844,000
Mississippi	1,560,000
Alabama	1,273,000
South Carolina	1,118,000

Flaxseed.	Bushels.
North Dakota	13,770,000
South Dakota	5,885,000
Minnesota	4,526,000
Wisconsin	400,000
Kansas	337,000

Hay.	Tons.
Iowa	6,460,000
New York	5,717,000
Illinois	4,743,000
Pennsylvania	4,677,000
Ohio	4,590,000

Oats.	Bushels.
Iowa	110,444,000
Illinois	94,300,000
Wisconsin	73,085,000
Minnesota	59,004,000
Nebraska	56,078,000

Rice.	Bushels.
Louisiana	11,550,000
Texas	9,142,000
South Carolina	480,000
Arkansas	467,400
Georgia	87,500

Rye.	Bushels.
Michigan	5,704,000
Pennsylvania	5,660,000
Wisconsin	5,225,000
New York	2,392,000
Minnesota	1,628,000

Tobacco.	Pounds.
Kentucky	195,600,000
North Carolina	134,000,000
Virginia	114,100,000
Tennessee	52,000,000
Pennsylvania	39,008,000

Wheat.	Bushels.
Kansas	76,809,000
Minnesota	68,557,000
North Dakota	68,428,000
Indiana	45,169,000
Nebraska	44,295,000

From my infancy I was passionately fond of reading, and all the money that came in my hands was laid out in the purchase of books.
—*Benjamin Franklin.*

Geology

In our general article on Geology in THE NEW PRACTICAL REFERENCE LIBRARY we treat of the origin of the earth, the formation of rocks, classes of rocks, the periods of geologic history, the so-called systems into which these periods are divided, and the present geological forces which are causing changes in the earth. From this article there are references to each of the twenty-eight periods and systems mentioned in the article; also to the articles on PHYSICAL GEOGRAPHY, DIKE, DIP, FOSSIL, FAULT, JOINT, which describe in more detail many of the features mentioned in the general article, GEOLOGY. The department also contains about 200 articles on mineralogy, including all the important rocks and earths, and some articles upon special phases of the subject, such as GEOLOGICAL SURVEY OF THE UNITED STATES, GLACIER, FOSSIL, MAMMOTH, ORE, PALEONTOLOGY, and an article on MINERALOGY.

OUTLINE.

I. DEFINITION.
II. THEORIES OF ORIGIN OF EARTH.
III. FORMATION OF ROCKS.—Key to all life before man.
    1. Igneous Rocks—Caused by heat.
    2. Stratified Rock—Caused by action of water.
    3. Metamorphic Rocks—Those whose original composition has been altered on account of heat, chemical action, moisture or pressure.
IV. GEOLOGIC PERIODS.
    1. Length or Extent.
        a. Determined by studying the fossils found in different stone formations.
    2. Object.
        a. To trace the development of vegetable and animal life by means of fossils of each stone period.
    3. Names.
        a. Azoic or Archean—Forming of igneous rocks.
            No form of animal life.
        b. Protozoic—Rock formations—granite, marbles, slates.
            Lowest forms of life appear as fossils.
        c. Paleozoic—Appearing of continents.
            Formation of coal measures.
            Rich vegetation—age of coal plants.
            Development of life from lowest forms to vertebrates.
            Age of fishes, insects, scorpions, amphibians.

d. Mesozoic—Formation of sandstone, chalk beds, gold, etc.
Vegetation—Great variety, trees resembling our oak, birch, poplar, etc.
Animals—Great variety, flying birds, reptiles, etc.
e. Cenozoic—Continents nearly as they are now.
Birds, mammals (milk-givers), etc.
Snow, floods, ice, formation of caves.
Age of man.

V. Biographies of Geologists.

Agassiz.	Dawson, J. W.	Hitchcock.	Murchison.	Smith.
Buckland.	Darwin.	Lamarck.	Owen.	Strabo.
Buffon.	Dana.	Le Conte.	Powell.	Thomson.
Cuvier.	Geikie.	Lyell.	Pythagoras.	Tyndall.
Dawson, G. M.	Hayden.	Miller.	Silliman.	Winchell.

QUESTIONS ON GEOLOGY.

What is geology? What is now the accepted theory as to the origin of the earth?

What proof have we that the interior of the earth is hot? Were the rocks of your neighborhood formed through the action of heat or water? Why your answer? What causes an earthquake? A volcanic eruption?

By a study of the colored plate of precious stones, what similarity do you see between the diamond and the opal? The turquoise? The amethyst?

What makes a hillside uneven and rough? What causes canyons?

Where does the soil come from? What is it? How formed?

Since the earth is being constantly worn down, what prevents it from being entirely immersed in the sea?

What is the difference between geology and mineralogy?

What are the seven varieties of marble? What is the difference between marble and granite?

What are some of the causes of the changes in the earth's crust at present? Cite some instances of change.

What are the uses of marble? Granite?

How is quartz used in the manufacture of porcelain?

What is amalgam?

What are some of the theories regarding the nature of the earth's interior?

How much fuel is required to smelt a ton of iron? How many hundred tons of coal per day is required to run a modern steamship? How many thousand tons to make a voyage across the Atlantic?

What is stratified rock?

By what means do we know the form of plant or animal life existing before man?

Which existed first, animals or plant? How do we know?

What is a quarry?

What is the difference between coal and diamonds?

What is the action of frost on rocks? What is the action of rain? Why?

What is the origin of the hills and mountains?

Where are the stratified rocks generally found?

What effect does ice have on rocks? Air?

Why do we sometimes find single rocks weighing many tons located on level farm lands?

How do waves change the seashore? What properties has water that it is able to decompose rocks?

What is a glacier? Where found? How formed? With what rapidity do they move? What effect would they have on surface?

What was the glacial period? What effects did it have on the earth?

What is the largest actual sum paid for a diamond? At what price is the stone now valued?

Of what element is the diamond the purest form?

For what do mining engineers use diamonds? Copperplate engravers?

What was the weight, cut and uncut, of the famous Koh-i-noor diamond? What is the remarkable size of the Cullianan diamond found in 1905?

Are watch cases generally of pure gold? Give reasons for answer.

How does the ruby compare in value with the diamond? The emerald?

Where and how are pearls obtained?

For what are you indebted to graphite every time you pick up your pencil to write?

What is onyx? Where is it found? What have you in your home made from it?

CORRELATED SUBJECTS: Physical Geography; Dike; Dip; Fossil; Fault; Valley; Joint; Metamorphism; Erosion; Nebular Hypothesis; Glacier; Periods and Systems of Time; Canyon.

Gold

KINDS.
- Pure gold
- Jewelers' gold
- Gold for coinage

DISTRIBUTION IN UNITED STATES.
- California
- Colorado
- Dakota
- Idaho
- Montana
- Nevada
- Alaska

GOLD FIELDS.
- Australia
- Peru
- Bolivia
- Ural Mountains
- New Zealand
- British Columbia
- Klondike
- South Africa

TEST QUESTIONS ON GOLD.

What is gold? What is its value compared with silver? With copper? With brass?

To what remarkable thinness can it be beaten?

Would a wire made from an ounce of gold stretch from New York City to Des Moines?

How much heavier is gold than water? Than silver?

How does the production of gold in the United States compare with the value of the wheat crop? With the corn crop? The cotton crop?

How many carats denote pure gold?

How much copper is used in gold coinage?

Gold jewelry is made of what degree of fineness?

In what parts of the world is gold found? How is it obtained?

How is it extracted from sand and gravel?

Where was the chief supply of gold found before the discovery in California?

What was the year of the gold fever in California?

Is gold found in any of the United States besides California?

How many hundred million dollars does the annual production of gold amount to?

When were the Gold Fields of Australia opened?

What kind of gold do dentists use in filling teeth?

What is the earliest record before Christ of gold beating? Was the art known to Homer?

What do gold beaters mean by a "cutch"?

How many hours must gold be beaten before it will spread out?

Iron

I. Properties.
  1. Ductility.
  2. Malleability.
  3. Hardness (tempering).
  4. Magnetism.

II. Impurities.
  1. Carbon.
  2. Silicon.
  3. Sulphur.
  4. Phosphorus.

III. Compounds.
  1. Oxides.
  2. Sulphides.
  3. Chloride.
  4. Hydrates.

IV. Ores.
  1. Kinds.
    a. Red hematite.
    b. Brown hematite.
    c. Magnetite.
    d. Spathic.
  2. Distribution.
    a. United States.
      Pennsylvania.
      Virginia.
      Adirondack Mts.
      Lake Superior regions, etc.
    b. Foreign Countries—
      Russia, England, Germany, Canada, Austria, Spain, Scandanavia.

V. Mining Ore.
  1. Methods.
    a. Blasting. Ore in form of ledge.
    b. Steam shovel. When ore is soft.
  2. Shipping.
    a. Methods of loading and unloading ore vessels.
    b. Ports.
  3. Smelting—Object.
    a. Crusher.
    b. Blast furnace.
    c. Manner of tapping, cooling, etc.

VI. Pig Iron.
  1. Characteristics.
    a. Rough.
    b. Coarse.
    c. Brittle.
  2. Uses.
    a. Iron castings—
      Stoves, framework, etc.

VII. Wrought Iron.
  1. Characteristics.
    a. Soft.
    b. Flexible.
    c. Ductile.
    d. Malleable.
  2. Uses.
    a. Nails, wire, etc.

VIII. Steel.
  1. Characteristics.
    a. Tough.
    b. Hard.
    c. Tenacious.
    d. Gray in color.
  2. Uses.
    a. Framework of large buildings.
    b. Bridges.
    c. Steel rails and ties.
    d. Watches—Mainsprings, etc.

IX. History of the Industry.
   1. Ancient—Egyptians, Assyrians, Babylonians, Romans, Greeks, Iron Age.
   2. Modern.
      a. United States ranks how?
      b. England ranks how?
      c. Germany ranks how?

X. Uses of Iron in Medicine.
   1. Blood purifier.
   2. Stimulates digestion.

QUESTIONS.

What is iron? Why are steel plants generally built near extensive coal beds?

Why does iron rust easily? What is rust? What kind of iron in your kitchen range?

Is there any other known metal that could be used for the same purposes as iron?

Which could you do without the better, gold or iron? Which constitutes the greatest factor in the world's progress?

Who was Krupp? Bessemer?

Why is coke used for blast furnaces?

What is slag? To what practical uses is it put?

Distinguish between pig iron, cast iron, wrought iron and steel. Name articles made from each.

What effect do repeated smeltings have on iron?

What can you say of the following: Carnegie, Schwab, Frick, Gates, etc.?

How did they handle iron in the iron age? What are some of the new uses of steel?

How much heavier is iron than water? For what purpose is pure iron used?

What is the name of the one continent which has no iron supply? Where is the best iron found in Europe?

How does the United States stand in the production of iron ore?

What is the method of mining iron ore?

How are the impurities separated from the iron?

How is a blast furnace operated?

In what is the molten iron cooled?

What does it cost per ton to transport iron from Duluth to Cleveland or adjoining ports?

EARLY USE OF IRON.

Note.—It has been a popular belief that iron was little known to the ancients, but Lepsius believes that the Egyptians used it for hand instruments, and that it was prepared in smelting furnaces 3000 B. C.

An iron band was found in an inner part of the Pyramids of Cheops, where the ancient architect had placed it not later than 2800 B. C.

In the tombs of Thebes and Memphis tools and other articles of iron have been found, some of which are among the treasures of the New York Historical Society.

Iron was so valued that it was seized as plunder by the victorious soldiers. An iron sickle was found beneath one of the sphinxes at Karnak, and iron was used for the door frames of the temple of Ptah. A piece of pure iron was found beneath the obelisk that now stands in Central Park, New York, when it was taken from its original position on the banks of the Nile.

The relics found show that the art of tempering was known at an early date. The Egyptians worked mines in the desert region of the south between the Nile and the Red Sea, and also near Mount Sinai in Palestine. The ruins of extensive iron works were found in 1873 near the Wells of Moses.

What makes steel valuable?
What is pig iron used for? Wrought iron?
When did iron come into general use?
Where in the Bible is the first reference to iron?
When was iron discovered in the United States?
When were the first iron works built in the United States?
Who introduced the use of anthracite coal for smelting?
What country leads the world in the iron and steel manufacture?
Which country is next in line?
How much fuel is required to smelt a ton of iron?
How is iron used in medicine? What effect does it have on the health?
What is meant by the "iron age?"
What is the leading iron-producing state?
Correlated subjects—Blast furnaces, steam shovel, rolling mills, Bessemer steel, flux.

Mining

I. Definition.
  1. Mining proper.
  2. Metallurgy.
    a. Separating metals from their ores.
II. Deposits.
  1. Beds or seams.
  2. Veins or lodes.
III. Machinery.
  1. For beds or seams of ore, shaft is sunk.
  2. For veins or lodes, vertical shaft is sunk.
  3. Sinking of shafts.
    a. Blasting, etc.
    b. Drill of steel driven by steam or electricity.
  4. Machinery for hoisting, crushing, separating, etc., dependent on kind of mines.
IV. Work Inside of Mine.
V. Shipping.
Correlated subjects: See All Metals.

MINING.

Gold.

(Also see Outline.)
How many carats fine is pure gold? Jewelers' gold? Standard gold for coinage?
Why is it necessary to combine gold with some other metal before using? What is the baser metal called?
Are watch cases generally of pure gold? Give reasons for answer. How does the United States rank as a gold producing country?
In what condition is gold found, and where? What other metals does gold unite with to form an alloy?
Describe processes of separating gold from its impurities. By whom are the assay offices established, and where?

Silver.

Give uses of silver. Is it ever used as a medicine?
What are its characteristics? What effect has the air upon it?
Where are the silver mines of the United States, Mexico, and South

America? What percentage of the world's supply does the United States produce?

With what other ores does silver readily unite?

What is meant by the standard silver dollar? When did this come into use?

Copper.

In what forms does copper occur in the earth and what other metals are found in copper ore?

What percentage of the world's supply does the United States produce, and where are the important copper producing sections?

Give processes of extracting copper from the ore.

An important use of copper is in connection with what industry?

What are some of the household uses of copper?

Iron.

(See outline.)

Lead.

What are some of the characteristics of lead? What other metals are sometimes obtained from lead ore?

What is white lead and for what is it used?

Give practical uses of lead along all lines. What is lead poisoning?

Why is lead so expensive?

What country stands first in the production of lead?

Sulphur.

Describe sulphur. What form does it take as a mineral?

In what regions is it generally found?

What percentage of the supply of sulphur is made into sulphuric acid? What are the uses of this acid?

How is sulphur used as a medicine? As a household help?

What country leads in the production of sulphur?

Coal.

In what position or form is coal found in the earth? Why do we know coal is of vegetable origin?

By what means is it reached?

What is meant by the term "firedamp?" How is a coal mine ventilated?

Where are the principal coal mines of the world?

What do you know of the miners and their lives? Who is John Mitchell?

Always read the preface to a book. It places you on a vantage ground and enables you to survey more completely the book itself.

In science, read by preference the newest books; in literature, the oldest. The classic literature is always modern. —*Bulwer-Lytton.*

Coal

I. Formation.
   1. Decayed vegetation.
      a. Pressure.
      b. Heat.
   2. Upheavals and depressions.
   3. Coal measures.

II. Varieties.
   1. Anthracite.
   2. Bituminous.
      a. Cannel.
   3. Lignite.

III. Distribution.
   1. Europe.
   2. Asia.
   3. Africa.
   4. America, etc.

IV. Production.
   1. United States.
   2. Great Britain.
   3. Germany, etc.

V. History of the Industry.

FORMATION.

What is coal?

How is it formed? What kind do you use in your home?

How are the veins separated from one another?

What means have we of knowing the sort of vegetation from which coal was formed?

How is it possible to know the number of upheavals and depressions which took place in the formation of the coal?

What is meant by the coal measures?

What did the vegetation of the coal period include?

What was the height of the ferns?

VARIETIES.

According to its hardness how is coal divided?

Which is the best variety of coal? Is it found near the surface or deep in the earth?

Where are the largest mines of this variety? For what is it generally used?

Does it produce smoke in burning?

Which variety is known as soft coal?

What causes the dense black smoke in burning soft coal?

Where are the great fields of this coal found? What are its important uses?

Describe cannel coal. For what is it especially desirable? Why is it very expensive?

Where is lignite coal found? How does it compare in age with other varieties?

Why is it useless for manufacturing purposes? In what state is it valuable for fuel?

DISTRIBUTION.

What are the leading coal producing countries of Europe?

Which country has the most extensive fields?

What country in Asia is supposed to have the most extensive coal fields in the world? What about their development?

What part of Africa contains coal fields?

Tell about the coal fields of Australia and the neighboring islands.

One hour a day profitably employed in reading would enable any person of ordinary capacity to master a complete science. One hour a day would make an ignorant man a well informed man in ten years.

History

HISTORY, in the true sense of the word, is a great deal more than mere dates and names; it is more than a fascinating story, since it fills the reader with reality. Take, now, your school history and supplement the lessons which it contains with readings from THE NEW PRACTICAL REFERENCE LIBRARY, and the dull, dry parts will become illuminated and the task of your study periods will develop into a recreation.

In THE NEW PRACTICAL REFERENCE LIBRARY is a general article on HISTORY, in which the three meanings of the term are described: history as a subject of study, history as a branch of science, and history as a branch of literature. Under the first head the spirit, content or meaning of history is shown; under the second, the materials with which historians deal and the methods by which they work are described. The division of history into periods, ancient, medieval and modern, is also discussed. Under the last head a list of the principal histories, from the time of Herodotus to that of Rhodes, is given. A reference in this article is made to the article HISTORY—METHODS OF TEACHING, which follows it.

In the article HISTORY—METHODS OF TEACHING, the purposes of historical instruction are named, with suggestions as to the time and place for emphasizing each of them; the preparation of the teacher is discussed and, finally, specific methods of teaching history in the primary grades, intermediate grades, and grammar grades are described, including lists of books peculiarly adapted to the work of each of these grades and for the assistance of the teacher.

The history of each nation is given in a subhead of the article upon that nation. These subdivisions contain numerous references to the histories of other nations, as well as to other articles upon important wars, battles, political events of sufficient importance to be known by distinctive names, such as CONGRESS OF VIENNA, BAREBONES PARLIAMENT, and others; treaties; famous documents; temporary systems of government, such as the commonwealth and the directory; great institutions, such as the feudal system and chivalry, and important special periods, such as the Dark Ages, the Middle Ages, etc. Frequent reference is also made to the biographies of famous individuals, and in a few cases general discussions of the periods in which they lived are given under their names; this is true of Napoleon and Cromwell. The history of the United States from the discovery of America is contained in a long article which forms a subdivision of the article UNITED STATES. This is subdivided by periods and contains frequent references to a great many other articles, such as those upon battles and wars, famous laws, treaties, congresses, documents and organizations. Among these titles are such as the following: THE ALABAMA; ALBANY CONVENTION; ANTIETAM, BATTLE OF; ANTI-FEDERALISTS; BACON'S REBELLION; BERING SEA CONTROVERSY; BLACK FRIDAY; BON HOMME RICHARD; BOSTON

Massacre; Charter Oak; Chinese Exclusion Act; Cincinnati, Society of the; Clayton-Bulwer Treaty; Canadian Constitution; the Northwest Rebellion, etc. The article upon each of the states contains a comparatively brief history of the state. The department of American biography is exceptionally large. Reference is made to it from almost every historical article. Under the name of each president the principal events of his administration are enumerated.

OUTLINE.

I. General Article.
   1. As a subject of study.
   2. As a branch of science.
   3. As a branch of literature.

II. History, Methods of Teaching.
   1. Purposes.
   2. Preparation of the teacher.
   3. Primary grades.
   4. Intermediate grades.
   5. Grammar grades.

III. Foreign History.
   1. Ancient.
   2. Medieval.
   3. Modern.
   4. National—Under titles of nations.
   5. Most important wars and battles—In separate articles.
   6. Important political events, such as treaties, congresses, documents, systems of government, institutions and periods — In separate articles.
   7. Biographies.

IV. Canadian History.
   1. General article—In article Canada.
   2. Provincial histories—Under separate provinces.
   3. Battles and wars.
   4. Political events, such as laws, unions, parliaments, documents and organizations.
   5. Biographies.

Ancient—476 A. D. (Before the fall of Rome.)
   Assyria and Babylonians.
   Egypt—Geography of, Nile.
   Hebrews—Israelites or Jews.
   Persians—Fall, of, Cyrus, Cambyses.
   Greece—Pericles, Alexander the Great, Macedonian Empire, Xerxes.
   Rome—Cincinnatus, Gauls, Carthage, Triumvirs.
   Barbarian tribes.

Medieval—476 A. D.—Sixteenth century. (From Rome to America.)
   Saracens—Mohammed, Hegira, Koran.
   Italy—Lombardy.
   Byzantine Empire—Justinian, The Greek Church.
   France—Charlemagne.
   Germany—Invention of printing.
   Spain—Castile and Aragon, Grenada.
   Portugal—Prince Henry, Diaz, Vasco da Gama.
   England—Teutons, Alfred the Great, William the Conqueror.

MODERN—Sixteenth century. (Down to modern times.)

England—Elizabeth, Stuarts, Ireland, Victoria, Gladstone.
France—Louis XV.
Germany—Luther, Reformation.
Scandinavia—Christian II., Gustavus, Ivan.
Italy—Papacy, Cæsar, Raphael.
Spain and Portugal—Philip II., Inquisition, Armada.
Russia—Peter the Great.
America—United States, Mexico, Cuba.

I. MEANING.

1. Events, forces and institutions denoting a nation's character and progress.
   a. Social.
   b. Industrial.
   c. Intellectual.
   d. Religious.
   e. Political.
   f. Influence of individuals.
2. Science which studies these conditions.
   a. Ruins, buildings, implements.
   b. Laws and documents regarding government.
   c. Art and literature.
   d. Contemporary writings.
3. Branch of literature in which these conditions are discussed.
   a. Earliest and greatest writings—Myths, traditions, etc.; valued for their literary merit rather than historical facts.
   b. Modern writings—Narration and search of truth without partiality.
   c. Other social sciences based upon it in regard to data, etc.

II. DIVISIONS.

1. Ancient—
   a. Struggle toward universal unity in thought, politics and religion.
   b. From primitive times to Charlemagne.
2. Medieval—
   a. Confusion of ancient ideals of universal unity and supplanted by extreme individualism.
   b. Extended to middle of fifteenth century, Fall of Constantinople.
3. Modern—
   a. Idea of nationality carried into all questions.
   b. Up to present time, including United States history.

QUESTIONS.

With what nation did written history begin?
Which is the longer, historic or prehistoric time?
Into what divisions is history usually separated?
From what time to what time does ancient history extend?
When did modern history begin?
How many centuries in the period covered by medieval history?
To which division does American history belong?

Ancient History

There is no study so conducive to culture as the study of history. It is sometimes very hard for a person to get a general survey of the entire subject of general history and to take up the study in a systematic and knowing way. For this reason we have portrayed this entire subject in a series of pen sketches which we believe will create an interest in this valuable study and will encourage deeper research on the part of the student.

Just a casual glance at our sketch of Egypt acquaints you with many of the interesting features in connection with the earliest civilization. The pyramids and sphinx, the Nile, Rameses, hieroglyphic writing, the desert, the camel and the mummy are immediately impressed on the student's mind, and this prepares him for the study of this country, following out the chronological summary as outlined. If a person but familiarizes himself with these summaries he will be acquainted with the great events of history.

This is followed with a characteristic sketch of China and other ancient nations. In the Hebrew sketch even our very suggestive border furnishes a fruitful study.

Grecian history is depicted on three charts, each representing a special period, the first representing the Heroic period, covering three hundred years of early history. We then show the period of Glory and this is followed by a chart on the Decline, represented by its characteristic figure of the mourning Athena. In Greek civilization we are told that "in all that pertains to beauty of form, nicety of language and subtlety of thought, the ancient Greeks are still our masters and teachers."

The entire history of Rome is also shown by three separate pen sketches. In the first sketch we have the Legendary chart, showing its early history. This is followed by the Republic, established in 509 B. C., and Rome as an Empire. In addition we supply you three special charts, one on Roman civilization, another showing social customs and the last on the Eternal City. A characteristic of this chart is the ten noms de plume as shown in the border. Our two charts showing Mohammedanism and mythology complete the series on ancient history. We trust this series will be the means of interesting many in the fruitful study of hitsory.

LIST OF PEN SKETCHES.

Egypt.
China.
Chaldea—Persia—Assyria.
The Hebrews.
Greece—Heroic Period.
Greece—Period of Glory.
Greece—Period of Decline.
Greece—Civilization.
Rome—Legendary Period.
Rome—The Republic.
Rome—The Empire.
Roman Civilization.
Rome—Social Customs.
The Eternal City.
Mythology.
Mohammedanism.

EGYPT

CARTOUCH OF SETI I

CARTOUCH OF RAMESES II

PROFILE OF RAMESES II (FROM MUMMY)

MUMMY OF A SACRED BULL

FORMS OF WRITING (AFTER HOMMEL)

PUNISHMENT AFTER DEATH (FROM A PAPYRUS)

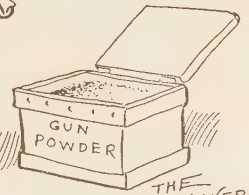
NEGRO CAPTIVES (FROM MONUMENT AT THEBES)

AN EGYPTIAN VILLAGE

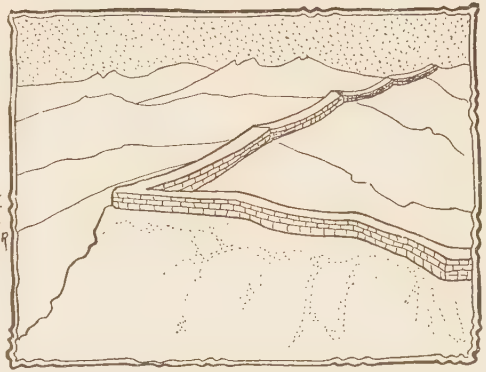
CHRONOLOGICAL SUMMARY

HISTORY OF EGYPT BEGINS—ABOUT 3000 B.C.
MENES FOUNDED MEMPHIS " 3892 B.C.
PYRAMID DYNASTY BEGAN " 3124 B.C.
HYKSOS CONQUER EGYPT " 2100 B.C.
RAMESES II THE GREAT " 1370 B.C.
EXODUS OF ISRAELITES " 1300 B.C.
CONQUEST OF EGYPT BY CAMBYSES " 525 B.C.
CONQUEST OF EGYPT BY ALEXANDER " 332 B.C.
RULE OF THE GREAT PTOLEMIES BEGAN " 323 B.C.
ROMAN PROVINCE UNDER AUGUSTUS CÆSAR " 30 A.D.
EGYPT CONQUERED BY THE ARABS— " 640 A.D.
CAIRO WAS BUILT - - - - - - - - 970 A.D.

CHINA



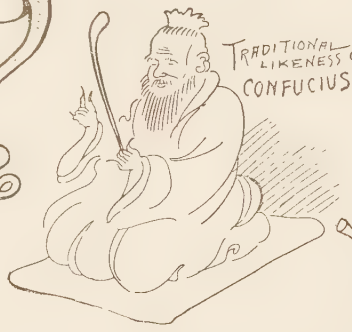
THE CHINESE WERE THE INVENTORS OF GUN POWDER & THE ART OF PRINTING



-THE GREAT WALL OF CHINA-

PI-YUNG-KUNG - HALL OF THE CLASSICS WHERE ARE KEPT THE REMAINS OF THE ANCIENT CHINESE LITERATURE

A MANDARIN



TRADITIONAL LIKENESS OF CONFUCIUS

CHRONOLOGICAL SUMMARY

MIGRATION OF CHINESE FROM THE WEST	ABOUT 3000 B.C.
CHOW DYNASTY FOUNDED	" 1122 B.C.
PHILOSOPHER LAO-TZE BORN	" 600 B.C.
PHILOSOPHER CONFUCIUS BORN	" 551 B.C.
TSIN DYNASTY FOUNDED	" 255 B.C.
GREAT WALL BUILT	3RD CENTURY
BUDDHISM INTRODUCED FROM INDIA	190 A.D.
TANG DYNASTY FOUNDED	618 A.D.

CHALDEA ··· PERSIA ··· ASSYRIA

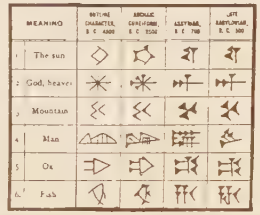
DOOR SOCKET OF SARGON I

THE TOMB OF CYRUS AT PASARGADAG

ASSYRIAN HELMET

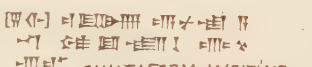
AN ARCHER

ASSYRIAN WARRIORS



MEANING	BABYLONIAN CHARACTER, B.C. 4000	ARCHAIC CHARACTER, B.C. 3500	ASSYRIAN, B.C. 700	LATE BABYLONIAN, B.C. 300
1 The sun				
2 God, heaven				
3 Mountain				
4 Man				
5 Ox				
6 Fish				

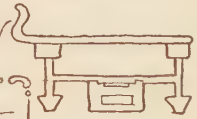
DEVELOPMENT OF CUNEIFORM WRITING (AFTER KING)



-CUNEIFORM WRITING-

A PERSIAN FOOT SOLDIER

AN INFANTRY OFFICER



AN ASSYRIAN BED

A CONTRACT TABLET

CHRONOLOGICAL SUMMARY

CHALDEA OR BABYLONIA

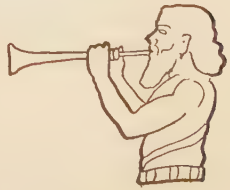
	BC
SARGON, KING OF CHALDEA	3800
BABYLON BECOMES THE POLITICAL CENTER	ABOUT 2400
CHALDEA CAPTURED BY ASSYRIANS	2286

PERSIA

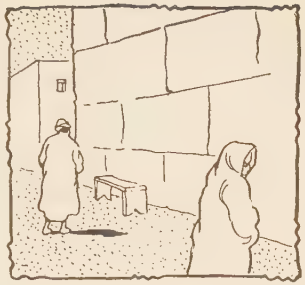
	BC
CYAXARES, KING OF PERSIA	625
NINEVEH CAPTURED BY MEDES	606
NEBUCHADNEZZAR	604
CYRUS CAPTURES BABYLON	538
DARIUS I	522
PERSIANS DEFEATED AT MARATHON	490
BATTLE OF ARBELA	331

-ASSYRIA-

	BC
TIGLATH-PILESER I	1130
ASSUR-NAZIR-PAL	883
TIGLATH-PILESER II	745
TEN TRIBES OF ISRAEL CAPTURED	722
SENNACHERIB	701
ESARHADDON	680
ASSUR-BANI-PAL	668



The Hebrews.



THE WAILING PLACE OF THE JEWS

PALESTINE

JEW READING ANCIENT SCROLL

THE TOMB OF RACHEL.

JEWISH CAPTIVES BEFORE SENNACHERIB.

CHRONOLOGICAL SUMMARY

	B.C.
ABRAHAM EMIGRATED FROM UR	2000
THE EXODUS	1700
KING SOLOMON	1015
KINGDOM OF ISRAEL	975-722
KINGDOM OF JUDAH	975-586
CONQUEST OF PALESTINE BY ALEXANDER	330
JERUSALEM CAPTURED BY POMPEY	63
JERUSALEM DESTROYED BY TITUS	A.D. 70
MOSQUE OF OMAR BUILT AT JERUSALEM	637

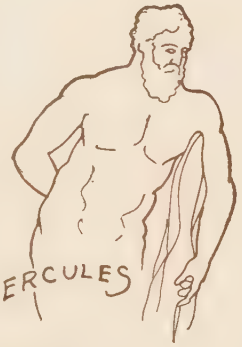
JEWISH PRIEST OFFERING INCENSE

GREECE

HEROIC PERIOD
1400 - 1100 B.C.

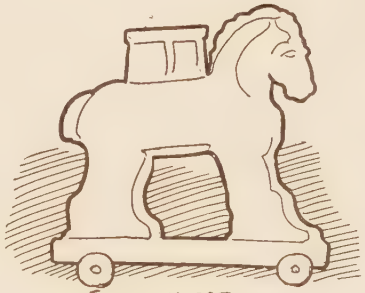
HEROES

- HERCULES
- THESEUS
- PERSEUS
- JASON
- ULYSSES



HERCULES

SCYLLA



-THE WOODEN HORSE-

THE RUSE BY WHICH THE GREEKS CAPTURED TROY

FIFTY OARED GREEK BOAT

-ONE OF THE FAMOUS VAPHIO CUPS-

CHRONOLOGICAL SUMMARY

	B.C.
CONQUEST OF THE PELASGIANS IN SOUTHERN GREECE BY THE ARCHAEANS	1320
THE TROJAN WAR	1194-1184
THE DORIAN MIGRATION	1100

MEETING OF ULYSSES AND PENELOPE

EVENTS

- THE LABORS OF HERCULES.
- THE QUEST OF THE GOLDEN FLEECE.
- THE TROJAN WAR.

GREECE

PERIOD OF GLORY
500 - 430 B.C.

FAMOUS MEN

- PERIANDER
- DRACO
- SOLON
- LEONIDAS
- THEMISTOCLES
- ARISTIDES
- CIMON
- EPHIALTES
- PERICLES

IMPORTANT BATTLES

- BURNING OF SARDIS
- MARATHON
- THERMOPYLAE
- SALAMIS
- PLATAEA
- MYCALE

PLAN OF THE BATTLE OF MARATHON

PERICLES

TRADITIONAL LIKENESS OF LEONIDAS

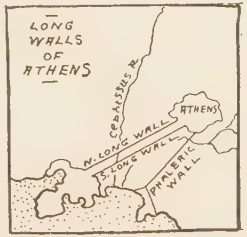
HOPLITE OR HEAVY ARMED GREEK WARRIOR

LIGHT ARMED GREEK SOLDIER

CHRONOLOGICAL SUMMARY

	B.C.
THE IONIC REVOLT	500-494
BATTLE OF MARATHON	490
THERMOPYLAE & SALAMIS	480
PLATAEA & MYCALE	479
CONFEDERACY OF DELOS	477
PERICLES	459-429
THE LONG WALLS BUILT AT ATHENS	458
THE THIRTY YEARS TRUCE	445

SOLDIERS PREPARING FOR WAR



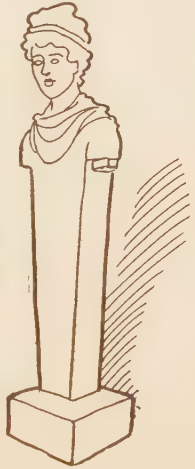
GREECE

PERIOD OF DECLINE
431 - 146 B.C.

FAMOUS MEN

- ARCHIDAMUS
- BRASIDAS
- ALCIBIADES
- LYSANDER
- XENOPHON
- DIONYSIUS
- DEMOSTHENES

PHILIP OF MACEDON



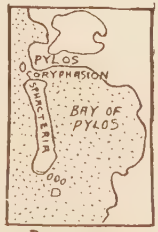
A HERMES PILLAR

THE MOURNING ATHENA

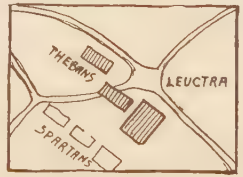
ALEXANDER THE GREAT

CHRONOLOGICAL SUMMARY

	B.C.
Peloponnesian War	431-404
Supremacy of Sparta	404-371
Battle of Leuctra	371
Alexander's Empire	336-323
Wars of the Succession	323-276
The Gallic Invasion	278
Battle of Cannae	216
Capture of Syracuse	212
Destruction of Corinth	146



-PYLOS-



PLAN OF BATTLE OF LEUCTRA.

IMPORTANT BATTLES

- MANTINEA
- ARGINUSAE
- FALL OF ATHENS
- LEUCTRA
- CHAERONEA
- GRANICUS
- ARBELA

GREEK CIVILIZATION

GREEK RUNNERS

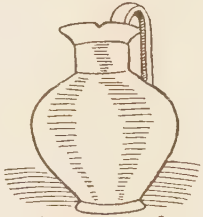
STYLES OF HAIR-DRESSING

THE ATHENIAN TYRANNICIDES, HARMODIUS & ARISTOGITON

DOOR KEY

GREEK HARP

A METAL WORKER



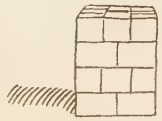
GREEK JUG

·COIN·

·GREEK COINS·

CIVILIZATION

Religion
Deities
Oracles
Education
Art
Architecture
Sculpture
Painting
Music
Literature
Philosophy
Oratory
Poetry
Drama
Institutions
Social Customs
Festivals
Slavery



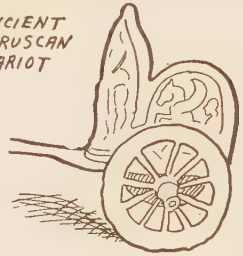
ANCIENT STONE ALTAR

ROME · LEGENDARY PERIOD ·

753 - 509 B.C.

ITALY
BEFORE THE GROWTH OF THE ROMAN EMPIRE

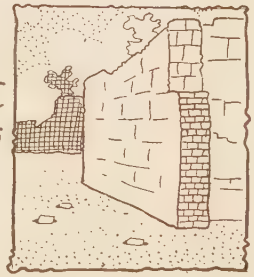
AN ETRUSCAN MUSICIAN



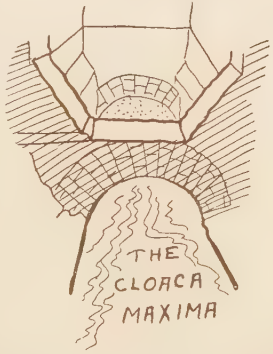
ANCIENT ETRUSCAN CHARIOT

CHRONOLOGICAL SUMMARY

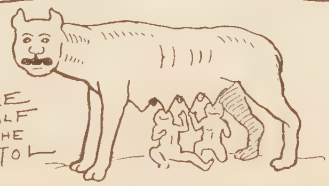
	B.C.
FOUNDING OF ROME	753
NUMA POMPILIUS	716
TULLUS HOSTILIUS	672
ANCUS MARTIUS	640
LUCIUS TARQUINIUS	616
SERVIUS TULLIUS	578
TARQUINIUS SUPERBUS	534
EXPULSION OF THE KINGS	509



ORIGINAL WALL BUILT BY ROMULUS



THE CLOACA MAXIMA



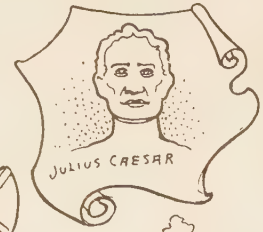
THE BRONZE WOLF OF THE CAPITOL

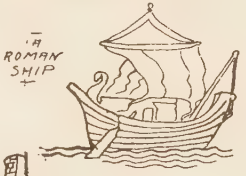
A ROMAN SOLDIER

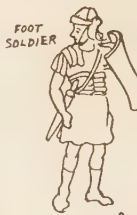
ROME

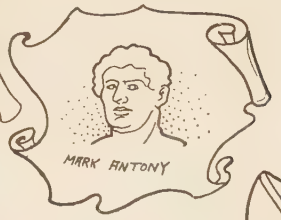
THE REPUBLIC

509 - 31 B.C.





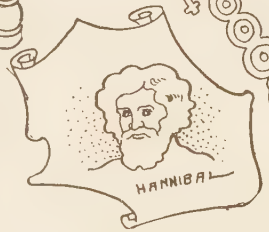




THE COLUMN OF DUILLIUS DECORATED WITH PROWS OF CAPTURED SHIPS

CHRONOLOGICAL SUMMARY

	B.C.
REPUBLIC ESTABLISHED	509
SACK OF ROME BY THE GAULS	390
THE SAMNITE WARS	343-290
THE PUNIC WARS	264-146
THE MACEDONIAN WARS	215-168
THE MITHRIDATIC WARS	88-63
JULIUS CAESAR	59-44
BATTLE OF PHILIPPI	42
BATTLE OF ACTIUM	31



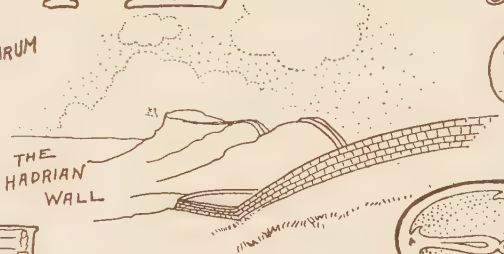
AUGER'S BIRDS

ROME · THE EMPIRE ·

31 B.C - 476 A.D.

-MÆCENAS-

THE LABARUM



THE HADRIAN WALL

CHRIST AS THE GOOD SHEPHERD (FROM THE CATACOMBS)

-CARACALLA-

-DIOCLETIAN-

THE ARCH OF CONSTANTINE

SHIELD - TIME OF -TRAJAN-

-HADRIAN-

TRAJAN'S COLUMN

-NERO-

A GOTHIC GEM

-VESPASIAN-

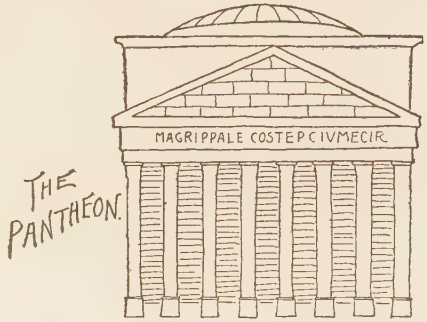
-CHRONOLOGICAL SUMMARY-

	A.D.
BURNING OF ROME	64
JERUSALEM DESTROYED BY TITUS	70
DESTRUCTION OF HERCULANEUM & POMPEII	79
CONQUEST OF BRITAIN	85
DISPERSION OF THE JEWISH RACE	132-135
CHRISTIANITY BECOMES THE STATE RELIGION	313
FINAL DIVISION OF THE EMPIRE	395
SACK OF ROME BY ALARIC	410
ROME PILLAGED BY VANDALS	455

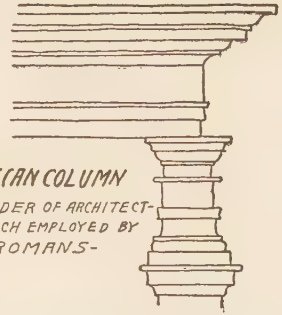
THE -JUDÆA CAPTA- COIN OF VESPASIAN

ROMAN CIVILIZATION

AN ETRUSCAN ALTAR



THE PANTHEON.



TUSCAN COLUMN

AN ORDER OF ARCHITECTURE MUCH EMPLOYED BY THE ROMANS-

MARS - RESTING -

- A STATUE IN THE VILLA LUDOVISI, ROME -

ROMAN TRIPOD

CICERO

ONE OF THE GREATEST ROMAN ORATORS

Roman Civilization

CHARACTER.
RELIGION.
Gods.
Laws
Penalties.
EDUCATION.
Schools
GOVERNMENT.
Republican
Imperial

ART.
Architecture
Sculpture
Painting
LITERATURE.
Origin.
Republican Period.
Augustan Epoch.
Decline.

CAMEO RING

DATING FROM TIME OF AUGUSTINE

ROMAN BOXING GLOVES

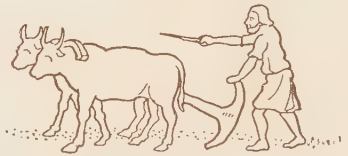
MADE OF LEATHER AND LOADED WITH LEAD

SOCIAL CUSTOMS OF THE ROMANS

A ROMAN ORATOR WEARING THE —TOGA—

ROMAN SANDALS

HELMET



ROMAN PLOW

GLADIATOR (FROM OLD MOSAIC)

RING

DATING FROM THE PERIOD OF THE EMPIRE

SOCIAL CUSTOMS

HOMES.
Architecture.
Family Life.
Commercial Life.
Social Life.
Festivals.
Games.

DRESS.
Distinctions.
The Toga.
The Tunic.

MARRIAGE.
Preparation.
Ceremony.

DEATH.
Funerals.
Ceremonies.

SLAVERY.
Origin.
Influence.
NUMBER OF SLAVES.
How Employed.

SEMICIRCULAR DINING COUCH (FROM A WALL PAINTING)

ETRUSCAN BURIAL URN

ROMAN HORN

ROMA—PATRON GODDESS OF THE CITY.

"THE NIOBE OF NATIONS." "QUEEN OF CITIES." "IMPERIAL CITY." "SEVEN HILLED CITY." "VALENTIA"

THE ROMAN EAGLE

The ETERNAL CITY.

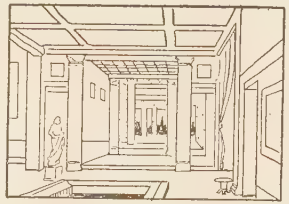
"NAMELESS CITY"

"CITY OF THE CAESARS"

THE SEVEN HILLS OF ·ROME·

THE ROMAN FORUM RESTORED

1-TEMPLE OF JUPITER
2- " " VESTA
3-BASILICA JULIA
4-REGIA
5-TEMPLE OF CASTOR & POLLUX
6-TABULARIUM
7-TEMPLE OF SATURN
8- " " VESPASIAN
9-TEMPLE OF CONCORD
10-COLUMN OF PHOCAS
11-STATUE OF DOMITIAN
12-ARCH OF S. SEVERUS
13-BASILICÆ FAUSTINA
14-TEMPLE OF ANTONINUS
15-ROSTRUM

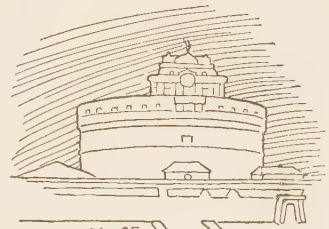


INTERIOR OF A ROMAN HOUSE

THE FLAVIAN AMPHITHEATER —OR— COLOSSEUM

"Mistress of the World"

B.C.		A.D.	
753.	Rome Founded.	64.	Rome Burned.
	THE SEVEN KINGS.	80–312.	Triumphal Arches.
753-716.	Romulus.	190.	Memorial Arches.
716-672.	Numa Pompilius.	80.	Colosseum Built.
672-640.	Tulius Hostilius.	455.	Plundered by Vandals.
640-614.	Ancus Martius.	1309.	Papal Chair Removed.
616-578.	Lucius Tarquinius.	1527.	Sacked by Bourbons.
578-534.	Servius Tullius.	1798.	Occupied by French.
534-509.	Tarquinius Superbus.	1848.	Pius IX. Driven out.
509.	Expulsion of Kings.	1849.	Pope Returns.
615.	Capitol Begun.	1871.	Capital of United Italy.
530.	Capitol Completed.	1901.	Population, 512,000.
390.	Besieged by Gauls.		



MAUSOLEUM OF HADRIAN BUILT BY HIMSELF AT ROME—

"THE LONE MOTHER OF DEAD EMPIRES"

MYTHOLOGY

MYTHOLOGY

Egyptian Gods.
Isis. Set.
Osiris. Ra.
Horus. Ptah.

Their Teaching and Beliefs on
Morality
Future Life
Judgment of the Dead.
Animal Worship

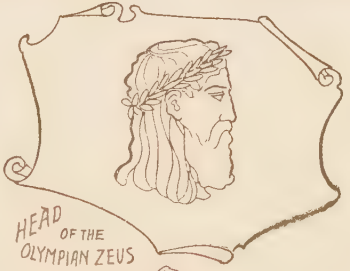
Roman and Greician Gods.
Jupiter, Argus, Apollo,
Eolus, Eros, Neptune,
Plutus. Hymen

Hindoo Gods.
Marut, Curera, Agni.
Pavan. Poleai.

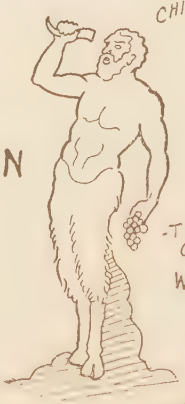
ASSUR
CHIEF ASSYRIAN DEITY

CERES ROMAN GODDESS OF HARVESTS

HORUS
AN EGYPTIAN GOD

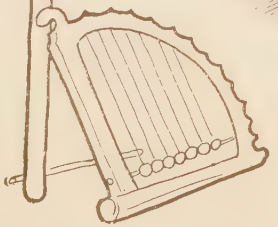


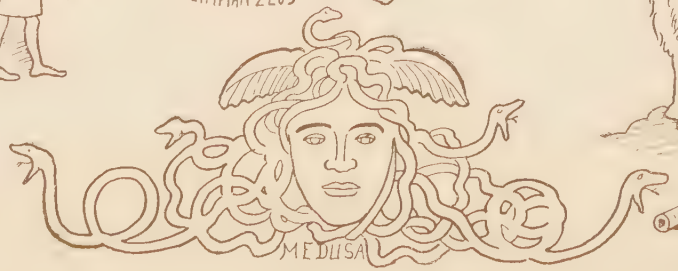
HEAD OF THE OLYMPIAN ZEUS



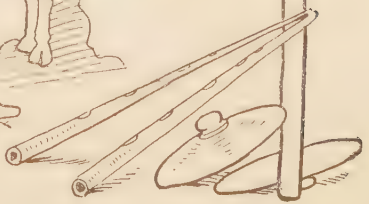
PAN

THE GREEK GOD OF THE WOODS & FIELDS

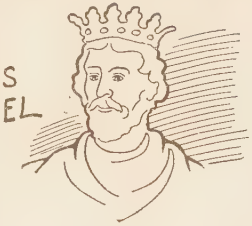


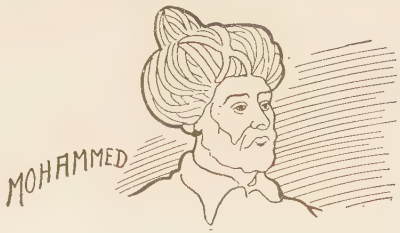


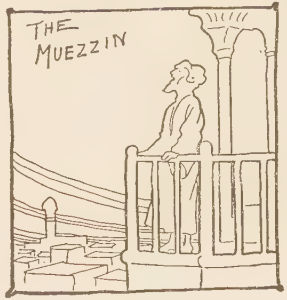
MEDUSA



MOHAMMEDANISM







CHRONOLOGICAL SUMMARY

	A.D.
BIRTH OF MOHAMMED	570
THE HEGIRA	622
THE RETURN TO MECCA	630
DEATH OF MOHAMMED	632
OMAR CAPTURES JERUSALEM	637
SARACENS CONQUER AFRICA & ENTER SPAIN	711
SARACENS REPULSED AT CONSTANTINOPLE	717
SARACENS REPULSED AT TOURS	732
END OF MOHAMMEDAN EXPANSION	750
HAROUN-AL-RASCHID, CALIPH	786

Medieval and Modern History

There is nothing more interesting than the study of history, and after supplying you with our series of pen sketches on ancient history we feel quite sure that you would not feel satisfied without a general survey of the history of the world, as shown by a few of the more prominent nations of the world.

We realize our inability to depict in fulness the number of minor events connected with this history, but we have endeavored to show, in a general way, the characteristic events and periods.

A familiarity with these charts and the outlines on them will not only give one a general knowledge of history, but will create an interest in the study and will enable one to associate other events with them as such study may be developed. Our pen sketch reviews of the Middle Ages, Feudalism and Chivalry, the Crusades and the Renaissance, acquaint one in a general way with subjects of prime importance in this study. A review of the history of France, in connection with these charts, and followed with special graphic pages, showing the French Revolution and France from the Consulate to the Present Time, gives one a bird's eye view of the subject and opens up so many avenues of research that one enters into such study with pleasure and develops it with profit.

In beginning the special study of England, we show a chart depicting the happenings prior to the Norman Conquest and follow with pen sketches showing the events in the Middle Ages, England Under the Stuarts and English History Since the Accession of Queen Victoria. This but shows our treatment of one of the great powers and so illustrates epochs and events that they become fixed mental pictures. Germany, Russia and Italy have special graphic treatment in this review.

Our modern history is supplemented with a review of the Norsemen and Columbus and their connection with the discovery of the New World, and this series of charts on medieval and modern history is followed by a pictorial review of the history of our own country and the very complete series of charts illustrating same.

France During the Middle Ages.
England Before the Norman Conquest.
Holy Roman Empire of the German Nation.
Feudalism and Chivalry.
The Crusades.
England During the Middle Ages.
The Renaissance.
England Under the Stuarts.
Russia.
French Revolution.
France From Consulate to Present Time.
England Since the Accession of Victoria.
Germany After 1814.
Unification of Italy.
The Norsemen in America.
Columbus.

FRANCE DURING THE MIDDLE AGES

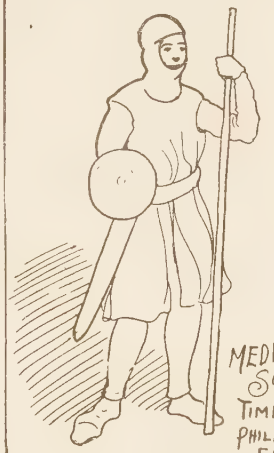
CHRONOLOGICAL SUMMARY

EVENT	DATE
CHARLEMAGNE EMPEROR	800
LOUIS THE PIOUS	814
VIKINGS IN SAXONY	851
PARIS BURNED BY VIKINGS	857
CHARLES THE BALD	875
CHARLES THE FAT	882
HUGH CAPET	987
FIRST CRUSADE	1096
SECOND CRUSADE	1147
PHILIP THE FAIR	1285
HUNDRED YEARS WAR	1338
POITIERS	1356
PEACE OF BRETIGNY	1360
MURDER OF DUKE OF ORLEANS	1407
AGINCOURT	1415
CASTILLON	1453

CHARLES THE SIMPLE

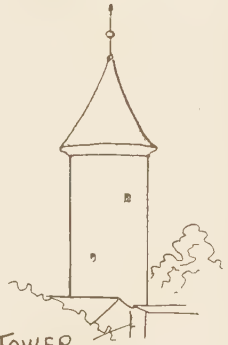
CHARLEMAGNE

CATHEDRAL OF AIX-LA-CHAPELLE
BURIAL PLACE OF CHARLEMAGNE

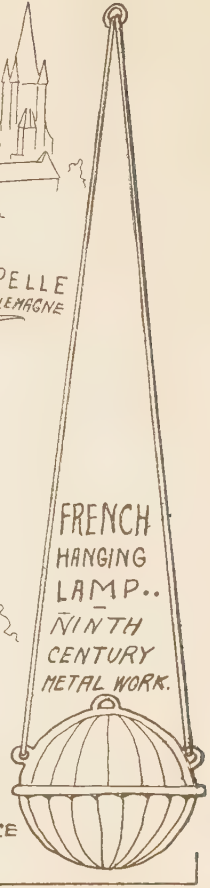


MEDIEVAL SOLDIER
TIME OF PHILIP THE FAIR

JEANNE D'ARC



TOWER OF JEANNE D'ARC
IN WHICH SHE WAS IMPRISONED AND TRIED AT ROUEN-FRANCE

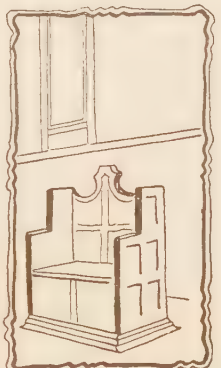


FRENCH HANGING LAMP.. NINTH CENTURY METAL WORK.

ENGLAND BEFORE THE NORMAN CONQUEST

GREAT MEN

ALFRED THE GREAT
ST. AUGUSTINE
ST. DUNSTAN
EGBERT
CANUTE
EDWARD
HAROLD
THE VENERABLE BEDE
CAEDMON

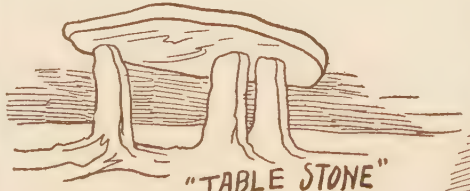


ST. AUGUSTINE'S CHAIR
RELIC OF THE FIRST ARCHBISHOP OF CANTERBURY

A DRUID PRIEST

ANGLO-SAXON BUCKLE

SEAL OF EDWARD THE CONFESSOR



"TABLE STONE"

SAINT MARTIN'S CROSS

CELTIC BROOCH—THE INFANT CHRIST BORNE BY SAINT CHRISTOPHER

CHRONOLOGICAL SUMMARY

FIRST VISIT OF JULIUS CAESAR TO BRITAIN—B.C. 55

ROMAN TROOPS WITHDRAW—A.D. 407

LANDING OF HENGIST & HORSA—449

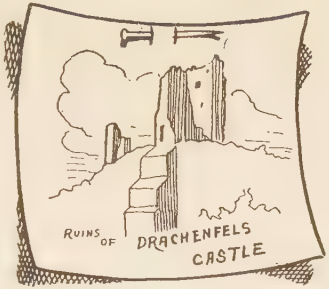
EGBERT KING OF ENGLAND—829

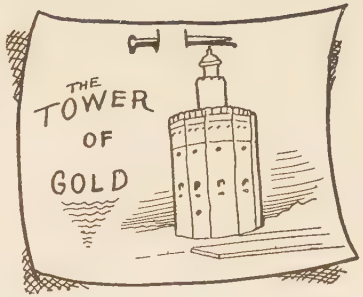
ALFRED THE GREAT—871

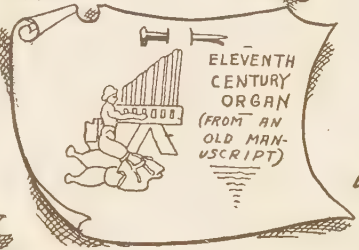
CANUTE—1016

EDWARD THE CONFESSOR 1042

HAROLD ELECTED KING — 1066







CHRONOLOGICAL SUMMARY

OTTO THE GREAT-----936	GREAT INTERREGNUM-1250-73
HOLY ROMAN EMPIRE FOUNDED-162	DEATH OF DANTE-1321
DIVISION OF GREEK & LATIN CHURCHES-1054	HUSSITE WAR-1419-34
LOMBARD LEAGUE----1168	FREDERICK III

TEUTONIC ORDER FOUNDED-1191

THE HOLY ROMAN EMPIRE OF THE GERMAN NATION..

Feudalism and Chivalry

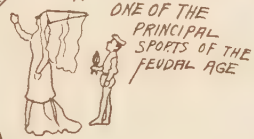
Feudalism

Origin – Latter part of 5th Cent.
Social Organizations
Act of Homage – Ceremony of Investiture
Feudal Obligations
Hereditary Rights
Feudal Homes and Families
Place of Church in Society
Military System
Decline in 14th Cent.
Defects and Merits

Chivalry

Knighthood
Knightly Virtues – Membership
Education – Ceremonies
Tournaments
Jousting – Awards
Decline – 14th Cent.
Influences

MEDIEVAL TOURNAMENT



HAWKING— ONE OF THE PRINCIPAL SPORTS OF THE FEUDAL AGE

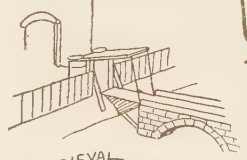
SERF AT WORK (FROM A TWELFTH CENTURY MANUSCRIPT)

DEVELOPMENT OF A KNIGHT

PAGE
BETWEEN THE AGES OF SEVEN & FOURTEEN, HE IS INSTRUCTED IN THE ART OF WAR-------
SQUIRE
AS A SQUIRE HE ATTENDS THE KNIGHT TO WHOM HE IS ATTACHED-----
KNIGHTED
AT THE AGE OF TWENTY-ONE HE IS KNIGHTED
A FULL FLEDGED KNIGHT

The Crusades

RICHARD COEUR DE LION



MEDIEVAL DRAW BRIDGE

TOMB OF GODFREY OF BOUILLON AT JERUSALEM

SEAL OF JOHN OF BRIENNE

SALADIN

THE PRIEST WHO PREACHED THE FIRST CRUSADE

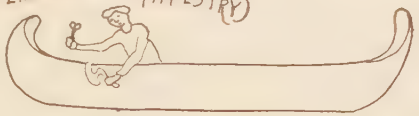
Chronological Summary

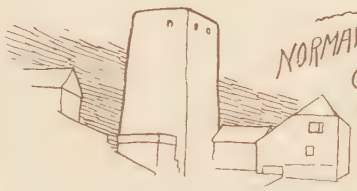
Event	Date
Beginning of first Crusade	1096
Capture of Jerusalem	1099
Beginning of 2nd Crusade	1147
Beginning of 3rd Crusade	1189
Fourth Crusade begun by Knights of St. John	1195
Fifth Crusade begun	1201
Children's Crusade begun	1212
Sixth Crusade begun	1217
Seventh Crusade headed by Pope Gregory II	1238
Eighth Crusade undertaken by St. Louis	1248
Ninth Crusade	1267

COSTUMES — TIME OF CRUSADES

CHURCH OF ST. JOHN THE BAPTIST

ENGLAND DURING THE MIDDLE AGES





NORMAN TOWER AT OXFORD ENGLAND IN WHICH QUEEN MATILDA WAS BESIEGED BY STEPHEN—1141—

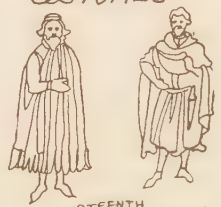
CHRONOLOGICAL SUMMARY

EVENT	DATE
WILLIAM I	1066
DOMESDAY BOOK	1086
WILLIAM RUFUS	1087
HENRY I	1100
STEPHEN	1135
HENRY II	1154
THOMAS A'BECKET	1170
RICHARD I	1189
KING JOHN	1199
THE MAGNA CHARTA	1215
HENRY III	1216
EDWARD I	1272
EDWARD II	1307
EDWARD III	1327
BATTLE OF CRE'CY	1346
THE PLAGUE	1349
BATTLE OF POITIERS	1356
RICHARD II	1377
HENRY IV	1399
HENRY V	1413
BATTLE OF AGINCOURT	1415
HENRY VI	1422
JEANNE D'ARC BURNED	1431

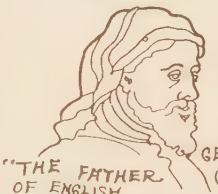
—AOT—

HENRY VIII

COSTUMES



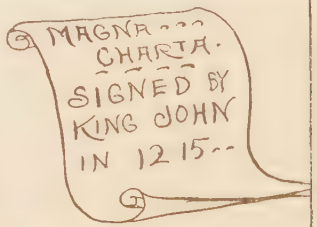
—FOURTEENTH CENTURY—



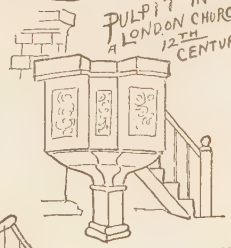
GEOFFREY CHAUCER

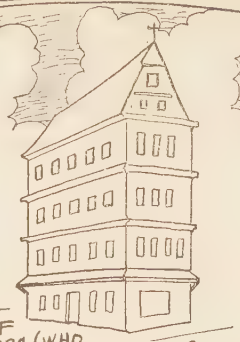
EFFIGY OF QUEEN ELEANOR

—KING JOHN—



THE RENAISSANCE





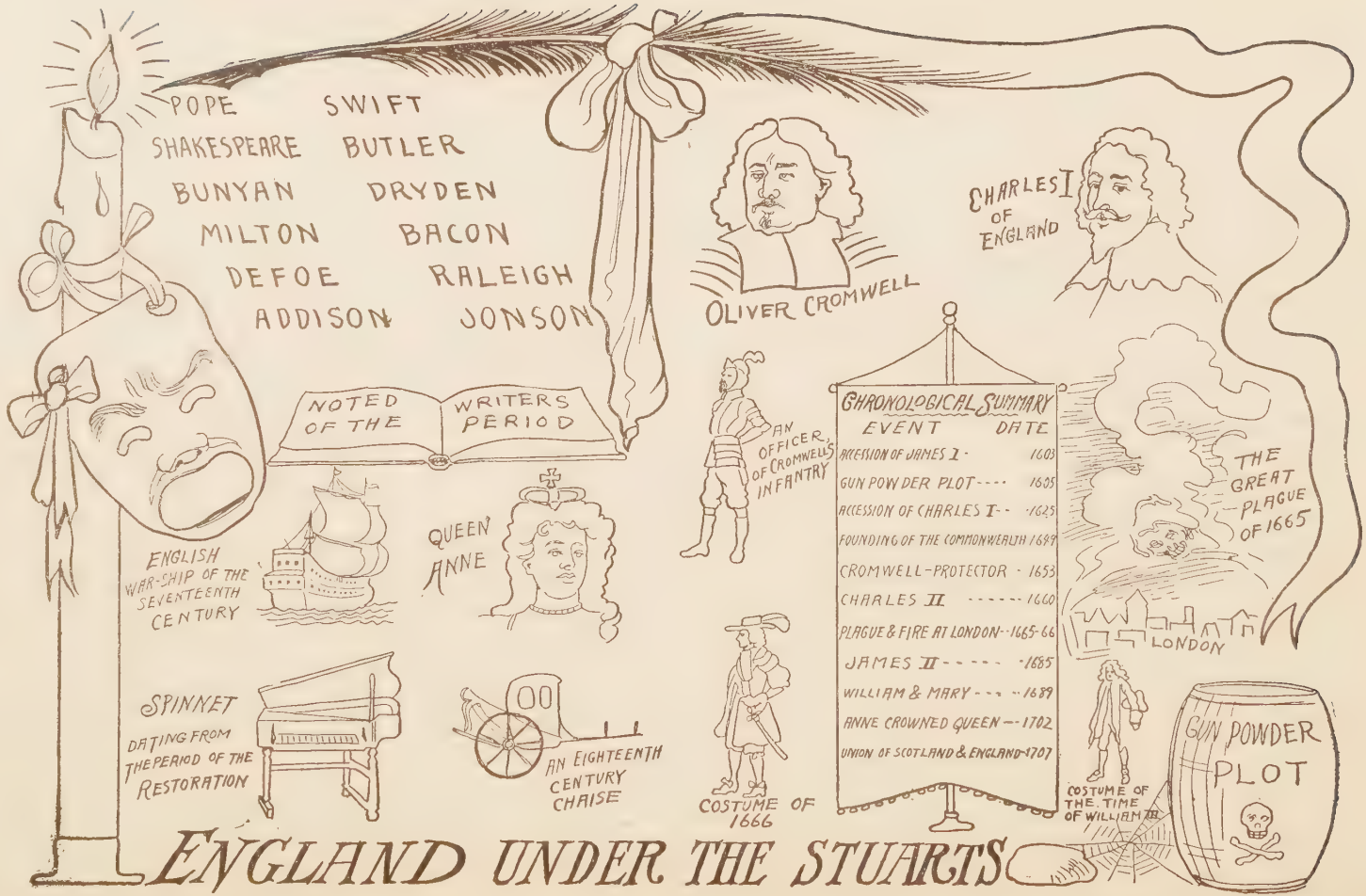
OUTLINE

THE LEARNING OF THE EARLY MIDDLE AGES -
- SCHOLASTICISM
- THE LATER SCHOOLMEN
- THE UNIVERSITIES

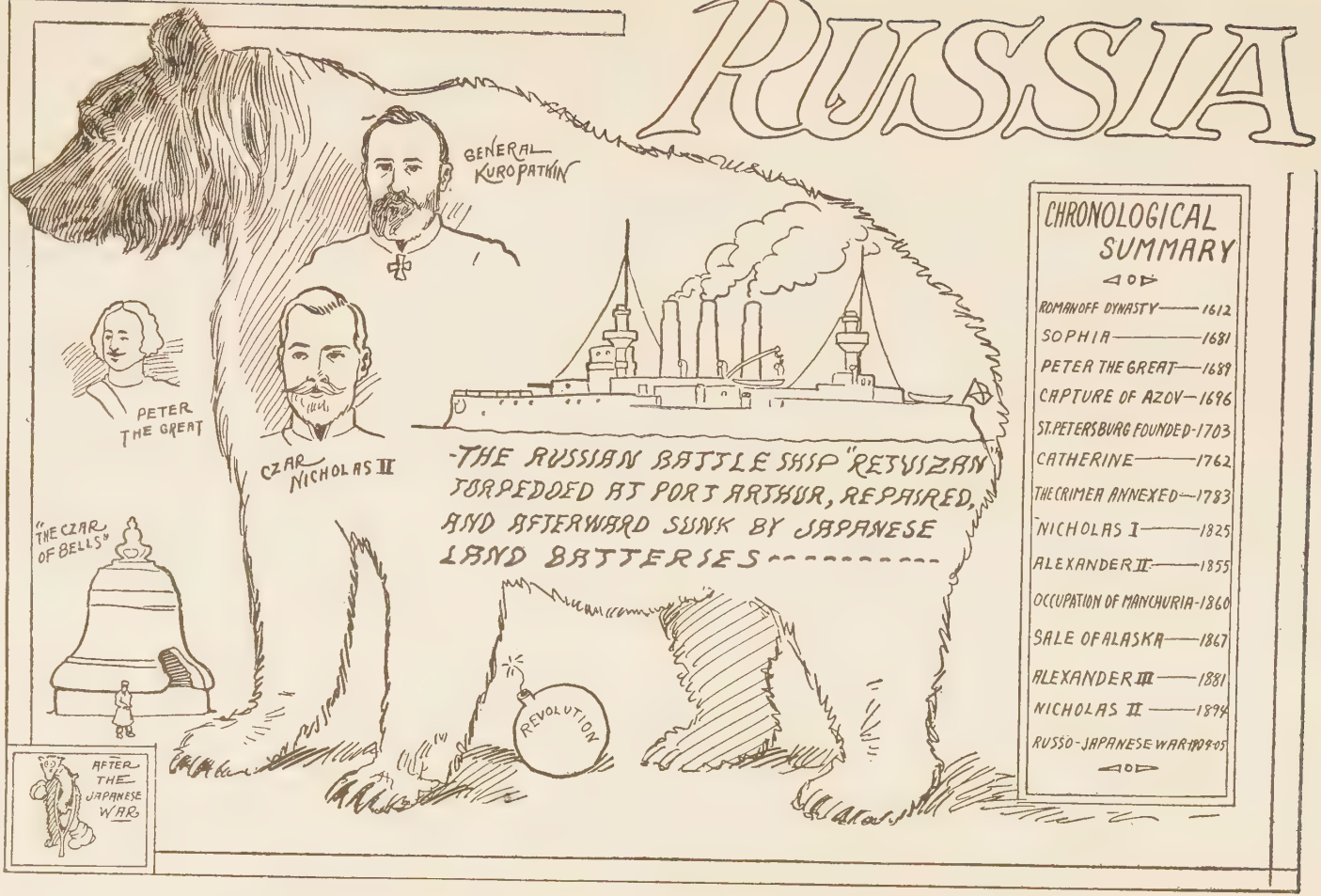
THE NEW LEARNING

THE REVIVAL IN LITERATURE
- IN ITALY
- IN FRANCE
- IN SPAIN

THE COMMERCIAL REVIVAL

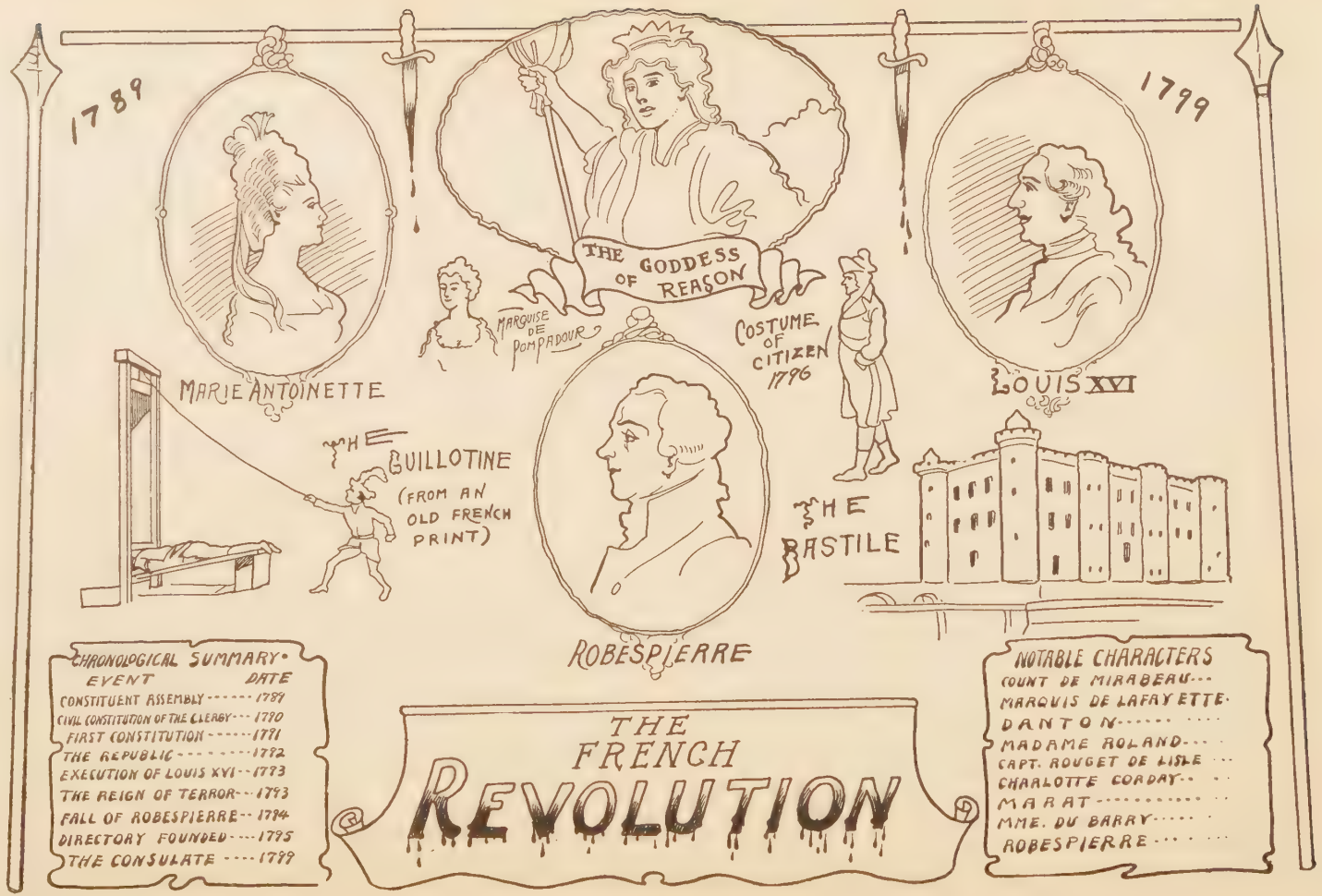

POPE
SWIFT
SHAKESPEARE
BUTLER
BUNYAN
DRYDEN
MILTON
BACON
DEFOE
RALEIGH
ADDISON
JONSON
NOTED WRITERS OF THE PERIOD
OLIVER CROMWELL
CHARLES I OF ENGLAND
AN OFFICER OF CROMWELL'S INFANTRY
CHRONOLOGICAL SUMMARY
EVENT DATE
ACCESSION OF JAMES I · 1603
GUN POWDER PLOT ···· 1605
ACCESSION OF CHARLES I ·· 1625
FOUNDING OF THE COMMONWEALTH 1649
CROMWELL-PROTECTOR · 1653
CHARLES II ····· 1660
PLAGUE & FIRE AT LONDON ·· 1665-66
JAMES II ····· 1685
WILLIAM & MARY ··· 1689
ANNE CROWNED QUEEN — 1702
UNION OF SCOTLAND & ENGLAND 1707
THE GREAT PLAGUE OF 1665
LONDON
ENGLISH WAR-SHIP OF THE SEVENTEENTH CENTURY
QUEEN ANNE
SPINNET
DATING FROM THE PERIOD OF THE RESTORATION
AN EIGHTEENTH CENTURY CHAISE
COSTUME OF 1666
COSTUME OF THE TIME OF WILLIAM III
GUN POWDER PLOT
ENGLAND UNDER THE STUARTS

RUSSIA


GENERAL KUROPATKIN
PETER THE GREAT
CZAR NICHOLAS II
"THE CZAR OF BELLS"
AFTER THE JAPANESE WAR
REVOLUTION
-THE RUSSIAN BATTLE SHIP "RETVIZAN" TORPEDOED AT PORT ARTHUR, REPAIRED, AND AFTERWARD SUNK BY JAPANESE LAND BATTERIES----------

CHRONOLOGICAL SUMMARY

ROMANOFF DYNASTY	1612
SOPHIA	1681
PETER THE GREAT	1689
CAPTURE OF AZOV	1696
ST. PETERSBURG FOUNDED	1703
CATHERINE	1762
THE CRIMEA ANNEXED	1783
NICHOLAS I	1825
ALEXANDER II	1855
OCCUPATION OF MANCHURIA	1860
SALE OF ALASKA	1867
ALEXANDER III	1881
NICHOLAS II	1894
RUSSO-JAPANESE WAR	1904-05


1789
1799
THE GODDESS OF REASON
MARQUISE DE POMPADOUR
COSTUME OF CITIZEN 1796
MARIE ANTOINETTE
LOUIS XVI
THE GUILLOTINE (FROM AN OLD FRENCH PRINT)
THE BASTILE
ROBESPIERRE
THE FRENCH REVOLUTION
CHRONOLOGICAL SUMMARY
EVENT — DATE
CONSTITUENT ASSEMBLY ····· 1789
CIVIL CONSTITUTION OF THE CLERGY ··· 1790
FIRST CONSTITUTION ····· 1791
THE REPUBLIC ····· 1792
EXECUTION OF LOUIS XVI ··· 1793
THE REIGN OF TERROR ··· 1793
FALL OF ROBESPIERRE ··· 1794
DIRECTORY FOUNDED ···· 1795
THE CONSULATE ···· 1799
NOTABLE CHARACTERS
COUNT DE MIRABEAU ···
MARQUIS DE LAFAYETTE ·
DANTON ····· ····
MADAME ROLAND ····
CAPT. ROUGET DE LISLE ···
CHARLOTTE CORDAY ·· ··
MARAT ····· ··
MME. DU BARRY ····· ·
ROBESPIERRE ····· ····

EXPLORATIONS

1400 | 1500 | 1600 | 1700

INDIANS

Nations **Tribes**

Catawbas
Uchees
Cherokees
Natchez
Sioux
Huron-Iroquois — Hurons, Eries
Mobilians — Creeks, Seminoles, Choctaws, Chickasaws
Iroquois (Six Tribes) — Mohawks, Oneidas, Onandagas, Cayugas, Senecas, Tuscaroras
Algonquins — Chippewas, Menomenees, Miamis, Sacs, Foxes, Kickapoos, Abenaquis, Narragansetts, Pequods, Massachusetts, Mohegans, Delawares, Powhattans, Shawnees

92 Columbus discovers West Indies
98 Columbus discovers American Continent
99 Amerigo Vespucci visits America
12 Ponce De Leon visits Florida
13 Balboa reaches Pacific Coast
20 Cortez conquers Mexico
28 De Narvaez explores Florida
39 De Soto visits America
41 De Soto discovers Mississippi River
65 St. Augustine founded by Melendez

SPANISH

97 John Cabot discovers Newfoundland
98 Sebastian Cabot explores American Coast
76 Frobisher visits Labrador
79 Drake explores Pacific Coast
83 Gilbert's voyage
84-87 Raleigh attempts to settle Roanoke Island
2 Gosnold's voyage
7 Settlement at Jamestown
20 Puritans settle at Plymouth
34 Maryland settled by Catholics

ENGLISH

24 Verrazzani explores Atlantic Coast
34 Cartier explores St. Lawrence
42 Roberval visits Canada
64 Huguenots in Florida
98 La Roche in Nova Scotia
4 De Monts founds Port Royal
8 Champlain founds Quebec

FRENCH

9 Hudson explores Hudson R.
14 May and Block explorations
14 New Amsterdam founded

DUTCH

Contemporaneous History

15 John Huss burned
29 Joan Arc raises siege of Orleans
55 War of the Roses
56 Turks defeated at Belgrade
69 Ferdinand marries Isabella
80-84 Inquisition
92 Ferdinand takes Granada
20 Field of the Cloth of Gold
21 Diet at Worms
30 Augsburg Confession
40 Order of Jesuits founded
54 Siberia discovered
87 Mary of Scots beheaded
88 Spanish Armada
32 Battle of Lutzen
48 Treaty of Westphalia
66 London Fire
71 Cossacks subdued
Peace of Ryswick 97
Peace of Carlowitz 99

COLONIES

1600 — 1700 — 1775

VIRGINIA
7 Settlement at Jamestown
8 John Smith governor
19 Slavery introduced
19 Legislative Assembly
24 Overthrow of London Co.
29 Sir John Harvey Gov. Berkeley 42
44 Indian Massacre 75 Bacon's Rebellion 93 Sothel's Rebellion
51 Navigation Acts
77 Proprietary Government
Settlers - English Adventurers Motive - Wealth Livelihood - Agriculture

MARYLAND
34 First settlement at St. Marys
49 Toleration Act
91 Royal Province
Settlers - Roman Catholics Motive - Religion Livelihood - Agriculture and Manufacturing

NORTH CAROLINA 90
53 First settlement from Virginia
63 Grant to Proprietors
91 Union of Carolinas
Settlers - Refugees and Huguenots Motive - Agriculture and Political Strife

15 Proprietary government
11 Coree War
29 Separation
Livelihood - Rice, Tar and Turpentine
William and Mary's College founded
32 Birth of Washington
Virginia Resolutions 65

NEW JERSEY
23 Settled by Dutch
64 Elizabethtown settled
65 Slavery introduced
32 Ft. Nassau destroyed by Ind.
73 Division East and West Jersey
88 Charter annulled
2 Reunion of Jerseys
38 Separated from New York
Settlers - Dutch and Quakers Motive - Agriculture Livelihood - Agriculture

NEW YORK
38 Delaware settled by Swedes
9 Hudson sails up Hudson River
47 Peter Stuyvesant
13 New Amsterdam settled
64 English Conquest
15 Trading post at Manhattan Is.
21 Dutch West India Co. formed
73 Reconquered by Dutch
29 Patroon system organized
74 English Colony 97
Andros' Administration 75
89 King William's War
90 First Intercolonial Assembly
Settlers - Dutch Motive - Trade Livelihood - Furs

DELAWARE
3 Becomes separate colony
82 Added to Pennsylvania
Settlers - Swedes and Quakers Motive - Agriculture Livelihood - Agriculture

32 Gov. Crosby
44 Negro Plot
Capt. Kidd Piracy
French and Indian War 54
First Colonial Congress 65

CONNECTICUT
33 Hartford settled
62 New Charter Granted
89 Charter hidden
Pequod War 36
43 New Haven Republic organized
1 Yale College founded
Settlers - Puritans and Colonists Motive - Agriculture and Religion Livelihood - Agriculture and Manufacturing

RHODE ISLAND
36 Settled by Roger Williams
87 Joined to New York
Newport founded 39
47 Code of laws enacted
Settlers - Dissenters Motive - Religion Livelihood - Agriculture and Fishing

MASSACHUSETTS
20 Settlement at Plymouth
23 New Hampshire settled
30 Capital at Boston 47 Public Schools Est.
Harvard College founded 38
75 King Philip's War
Loses Charter 84 92 Witchcraft
39 First printing press at Cambridge
90 King William's War
Settlers - Puritans Motive - Religion Livelihood - Farming and Fishing
90 First paper money
2 Queen Anne's War
French and Indian War 54
44 King George's War
Quebec captured 59
45 Capture of Louisburg

NEW HAMPSHIRE
79 Separate Col.
98 Absorbed by Massachusetts
Settlers - Colonists from Massachusetts Motive - Trade Livelihood - Agriculture and Fishing

NEW HAMPSHIRE
41 Finally separated

SOUTH CAROLINA
70 Settled by English
71 Slavery Intro. 80 Charleston founded
Settlers - Refugees Motive- Agriculture and Religion Livelihood- Cotton, Rice and Silk
2 Expedition against St. Augustine
6 Spanish invasion
29 Royal Province

PENNSYLVANIA 18 Death of Penn
81 Settled 92 Penn dispossessed
82 Ind. Treaty
1 Charter of Privileges
French and Indian War 54
Braddock's defeat 55
Settlers - Quakers Motive - Religion Livelihood - Agriculture, Mining and Manufacturing

GEORGIA 53 Royal Province
33 Settled at Savannah
39 War with Spaniards
Settlers - Scotch and Poor Motive- Philanthropy Livelihood - Cotton

REVOLUTION

1775	1776	1777	1778	1779	1780	1781
Lexington and Concord April 19 Smith Parker Pitcairn	Dorchester Heights March 4 Washington	Princeton Jan. 3 Washington Mawhood	Naval Battle March 7 Randolph Yarmouth	Kettle Creek Feb. 14 Pickens Tories	Monk's Corner April 14 Huger Tarleton	Cowpens Jan. 17 Morgan Tarleton
Ticonderoga May 10 Allen Arnold	Sullivan's Island June 28 Clinton Moultrie Parker	Fort Schuyler Aug. 3 Herkimer St. Leger	Monmouth June 28 Washington Clinton	Vincennes Feb. 25 Clark Hamilton	Capture of Charleston May 12 Clinton Lincoln Cornwallis	Guilford Courthouse March 15 Greene Cornwallis
Crown Point May 12 Warner	Long Island August 27 Putnam Clinton	Bennington Aug. 16 Stark Baum Warner Breyman	Wyoming Massacre July 3 Indians Butler	Brier Creek March 3 Ashe Prevost	Waxhaw Creek May 29 Buford Tarleton	Hobkirk's Hill April 25 Greene Rawdon
Bunker Hill June 17 Prescott Howe	Harlem Plains Sept. 16 Knowlton Leitch Leslie	Brandywine Sept. 11 Washington Howe	Newport Aug. 29 Greene	Stony Point July 16 Wayne	Hanging Rock Aug. 6 American Sumter Loyalists	Fort Watson April 26 Marion Lee
Capture of Montreal Nov. 13 Montgomery Prescott	White Plains Oct. 28 Washington Howe	Bemis Heights Sept. 19 Gates Burgoyne	Light Horse captured Sept. 28 Baylor Grey	Elmira Aug. 29 Sullivan Indians	Camden Aug. 16 Gates Cornwallis	Jamestown Ford July 4 Wayne Cornwallis
Great Bridge Dec. 9 Dunmore	Fort Washington Nov. 16 Magaw Howe	Germantown Oct. 4 Washington Howe	Massacre Oct. 15 Pulaski's Infantry Ferguson	Paul Jones' Victory Sept. 23 Richard Serapis	Fishing Creek Aug. 18 Sumter Tarleton	Fort Griswold Sept. 6 Ledyard Arnold
Quebec Dec. 31 Arnold Montgomery	Trenton Dec. 26 Donop Washington Rall	Saratoga Oct. 7 Gates Burgoyne	Cherry Val. Massacre Nov. 10 Indians Butler	Savannah Oct. 9 Lincoln D'Estaing Prevost	King's Mountain Oct. 7 Campbell Ferguson	Eutaw Springs Sept. 8 Greene Stewart
		Fort Mercer Oct. 23 Greene Donop	Savannah Seized Dec. 29 Campbell		Blackstock Nov. 20 Sumter Tarleton	Siege of Yorktown Sept. 8 to Oct. 19 Washington Cornwallis
Troops Enlisted: 37,363	89,761	68,720	51,046	44,275	43,079	29,340
Miscellany: Washington Commander in Chief First Continental Currency	Evacuation of Boston Declaration of Independence	Congress adopts Flag Articles of Confederation	Alliance with France Charleston Burned	Depreciation of Federal Money	First Bank Chartered England Declares War with Holland	Federal Union Established Bank of North America Chartered

AMERICANS BRITISH INDECISIVE

ADMINISTRATIONS

		1789	1797	1801	1809	1817
EXECUTIVE	President	WASHINGTON	ADAMS	JEFFERSON	MADISON	
	Leaders in Cabinet	Jefferson, Hamilton	Pickering, Wolcott	Madison, Dearborn	Gallatin, Dallas	
	Important Messages & Papers	Farewell Address		First Written Message		
JUDICIAL	Chief Justice	Jay	Ellsworth	Marshall		
	Decisions			Marbury and Madison		
LEGISLATIVE	Pres. of Senate	Adams	Jefferson	Burr, Clinton	Clinton, Gerry	
	Speaker of House	Muhlenberg, Trumbull, Dayton	Sedgwick	Macon, Varnum	Clay, Cheves	
	Number of Members	Senate 26, House 65	Senate 32, House 105	Senate 32, House 141	Senate 34, House 181	
	Leaders	Madison, Gerry	Clay	J. Q. Adams	Calhoun, Webster	
	Laws	Revenue Bill, Naturalization Law	Alien and Sedition Acts	Embargo Act	Non Intercourse Act	
IMPORTANT EVENTS	Wars	Indian, Whisky Rebellion	Quasi	Tripoli	Indian, War of 1812	
	Inventions	Cotton Gin, Nail Cutter	Locomotive Plow	Steamboat, Blow Pipe, Steam Dredge	Breech-loading Rifle, Printing of Cotton Goods	
	Acquisition Territories			Louisiana		
	Foreign Relations	Treaty with England, Treaty with Spain	Treaty with France		Treaty of Ghent	
	Slavery	Petition to Abolish sent to Congress		Slave Trade Abolished		
	Deaths	Allen, Franklin, Hancock, Jones	Henry, Washington	Hamilton, Sam'l Adams, Moultrie	Clinton, Gerry	
	States Admitted	Vermont, Kentucky, Tennessee		Ohio	Louisiana, Indiana	
	Miscellany	Census, Capitol Moved		Lewis & Clark Expedition, West Point Academy	Washington Burned	
	Foreign Events	French Revolution		Milan Decree	Revolution in Venezuela, Mexican Uprising	

ADMINISTRATIONS

	1817	1825	1829	1837	1841	1845	1849
Pres.	MONROE	ADAMS	JACKSON	VAN BUREN	HARRISON TYLER	POLK	
Cabn't	Adams Calhoun	Clay Rush	Van Buren Livingston Berrien	Forsyth	Webster Calhoun	Buchanan	
Messages	Monroe Doctrine		Bank Message				
Chief Justice			Taney				
Decisions	Dartmouth College						
Pres. Senate	Tompkins	Calhoun	Calhoun Van Buren	Johnson		Dallas	
Speak. House	Clay Taylor Barbour	Taylor Stevenson	Bell Polk	Hunter	White Jones	Davis Winthrop	
No. Mems	Senate 42 House 213	Senate 48 House 213	Senate 48 House 240	Senate 52 House 240	Senate 52 House 223	Senate 58 House 223	
Leaders	Clay Webster Jackson	Van Buren Buchanan	Webster Clay Hayne Benton	Wright Adams		Wilmot Corwin	
Laws	Tenure of Office Act		U. S. Bank Bill Vetoed Force Act	Sub-Treasury Bill	Annexation Bill	Wilmot Proviso	
Wars	Seminole		Black Hawk Seminole	Seminole	Dorr Rebellion	Mexican	
Inventions	Shoe Pegs Velocipede	Planing Mach. Passenger Train	Colt's Revolver Typewriter Chloroform used	Friction Match Elec. Telegraph	Telegraph Line Use of Ether	Sewing Machine Hoe Ptg. Press	
Acquisitions	Florida						
For'n Rel.	Treaty with Canada		Treaty with Brazil		Webster-Ashburton	Treaty of Hidalgo	
Slavery	Missouri Compromise	Slavery abolished in N. Y.	Anti-Slavery in New England	Anti-Slavery Party	Growth of Abolition	Wilmot Proviso	
Deaths	Decatur Boone Stark	Adams Jefferson	Jay Monroe Madison Marshall	Black Hawk	Channing Jackson	J. Q. Adams	
States Admit.	Mississippi Illinois Alabama Maine Missouri		Michigan Arkansas		Texas Florida	Iowa Wisconsin	
Misc'l any	First Steam Voyage across the Atlantic	First Threshing Machine	Rise of American Literature	Indians removed to Indian Ter.	Postage Stamps	Discovery of Gold in Calif.	
For'n Events	Mexican Revolution		Independence of Mexico Independence of Texas	Canadian Reb. Victoria Crown.	Federal Union in C. A. Dissolved		

ADMINISTRATIONS

	1849	1853	1857	1861	1869	1877	1881
Pres.	TAYLOR FILLMORE	PIERCE	BUCHANAN	LINCOLN JOHNSON	GRANT	HAYES	
Cabn't	Webster Meridith	Marcy Davis	Cass Dix	Seward McCulloch	Fish Sherman Brewster	Evarts Sherman	
Messages			Revolutionary Message	Emancipation Proc. Amnesty			
Chief Just.				Chase	Waite		
Decisions							
Pres. Senate			Breckenridge	Hamlin	Colfax Wilson	Wheeler	
Speak. House	Cobb Boyd Banks		Orr Pennington	Grow Colfax	Blaine Kerr Randall		
No. Mems	Senate 62 House 237	Senate 62 House 237	Senate 66 House 243	Senate 50 House 243	Senate 74 House 293	Senate 76 House 293	
Leaders	Douglas Davis	Cass Stephens	Seward Cameron	Stevens Morrell Sumner Crittenden	Morton Schurz Wilson Trumbull	Edmunds Bland	
Laws	Omnibus Bill	Kansas-Nebr. Bill		Income Tax Law Civil Rights Bill	Salary Act	Anti-Chinese Bill	
Wars		Border Warfare	J. Brown's Raid Mormon Insur'n	Civil War	Modoc Sioux	Nez Perce	
Inventions		Type Setting Machine	Sleeping Car Atlantic Cable	Repeating Rifles Gatling Guns	Fire Extinguisher Telephone Crematory	Steam Heating Phonograph	
Acquisitions		Gadsden		Alaska			
For'n Rel.	Clayton-Bulwer Treaty	Treaty with Japan	Treaty with China	Burlingame Treaty	Treaty of Washington	New Chinese Treaty	
Slavery	Fugitive Slave Law	Underground Railway	Dred Scott Decision	Secession of States 13th Amendment	Ku Klux Klan Colored Senator	Negro Exodus	
Deaths	Calhoun Webster Clay		Irving Mann	Tyler Van Buren Jackson Buchanan	Greeley Pierce Prentice Farragut	Bryant Young	
States Admit.	California		Minnesota Kansas Oregon	West Virginia Nevada Nebraska	Colorado		
Misc. Many		Lopez Expedition	Secession	Atlantic Cable Laid	Pacific Railroad Chicago Fire Weather Bureau	Electric Light Life Sv. Station	
For'n Events	Cuban Revolution	Ostend Manifesto	Three Year War in Mexico	Fenian Raid in Canada Wars in South America	Franco-German War	Famine in Brazil	

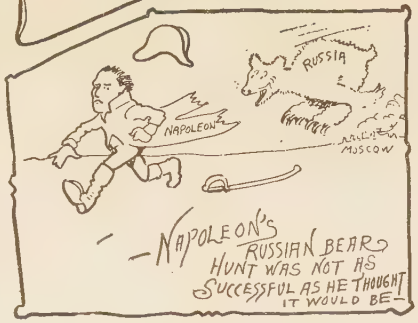
ADMINISTRATIONS

	1881	1885	1889	1893	1897	1905	1909
Pres.	GARFIELD ARTHUR	CLEVELAND	HARRISON	CLEVELAND	MC KINLEY ROOSEVELT		TAFT
Cabn't	Blaine Lincoln	Bayard Fairchild	Blaine Elkins	Olney Carlisle	Root Day Wilson Hay	Taft Root	
Messages				Venezuela	Panama Canal	Trusts	
Chief Just.			Fuller				
Decisions				Income Tax	Northern Securities		
Pres. Senate		Hendricks	Morton	Stevenson	Hobart Roosevelt	Fairbanks	Sherman
Speak. House	Keifer Carlisle		Reed Crisp Reed		Henderson	Cannon	
No. Mems	Senate 76 House 332	Senate 76 House 332	Senate 88 House 357	Senate 88 House 357	Senate 90 House 386	Senate 90 House 386	Senate 92 House 391
Leaders	Pendleton Conklin	Logan Gorman	Mc Kinley Sherman	Wilson Hill	Dingley Williams Hanna Hoar	Lodge Tillman	
Laws	Civil Service Chinese Bill	In's. Com. Act Dawes' Bill	International Copyright Law	Sherman Law Wilson Bill	Chinese Exclusion Bill	Pure Food Law Meat Insp. Bill	
Wars	Apaches Captured	Anarchist Riots	Sioux War	Coal Strikes Railroad Strikes	Spanish American Philippine	Springfield Riot	
Inventions	Flying Machine		Natural Gas used	Niagara Falls Harnessed	Liquefied Air Wireless Telegraphy	Aeroplane	
Acquisitions					Hawaiian Islands Porto Rico Guam Philippines Samoa		
For'n Rel.	Treaty with China	Extrad. Treaty C-Bayard Treaty	Samoan Treaty Recip. Treaty		Arbitration Treaty Hay-Pauncefote Treaty	Hay-Varilla Treaty	
Slavery							
Deaths	Garfield Longfellow Emerson	Sheridan Arthur Seymour Grant	Fremont		Jos. Jefferson Mc Kinley	Harper Hoar Cleveland	
States Admit.		Wash. Mont. N.and S.Dakota	Idaho Wyoming	Utah		Oklahoma	
Miscellany	Washington Monument	Earthquake in Charleston	Johnstown Food	World's Fair at Chicago	Baltimore Fire Hague Peace Conference	Panama Canal	
For'n Events		Exclusion Act in China	Brazil Repub. Boxer Rebellion	Cuban Rev. Hawaiian Rev.	Cuba under protection of U. S. Boer War	Russo-Japanese War	

CIVIL WAR

1861	1862	1863	1864	1865
Fort Sumter Apr. 14 Anderson Beauregard	Mill Spring Jan. 19 Thomas Zollicoffer	Galveston Jan. 1 Renshaw Magruder	Olustee Feb. 20 Seymour Finnegan	Fort Fisher Jan.16 Porter Butler Whiting
Sewell's Point May 20 Ward Virginia Troops	Fort Donelson Feb. 16 Grant Buckner	Arkansas Post Jan. 11 Mc Clernand	Fort De Russy Mar. 14 Franklin Taylor	Old Town Creek Feb. 20 Cox
Fairfax Ct. Hse. June 1 Tompkins	Pea Ridge Mar. 7 Curtis Van Dorn	Bisland Apr. 12 Banks Taylor	Sabin Cross Rds. Apr. 8 Ransom	Fayetteville Mar. 8 Kilpatrick Hampton
Philippi June 3 Kelley Porterfield	Naval Battle Mar. 9 Monitor Merrimac	Port Gibson May 1 Mc Pherson	Wilderness May 5-6 Grant Lee	Averasboro Mar. 16 Sherman Hardee
Big Bethel June 10 Pierce Hill Magruder	Shiloh Apr. 6-7 Grant Johnston	Chancellorsville May 2 Hooker Lee	Spottsylvania May 10-12 Grant Lee	Bentonsville Mar. 19 Sherman Johnston
Romney Bridge June 11 Wallace Johnston	Williamsburg May 5 Mc Clellan Johnston	Suffolk May 3 Peck Longstreet	Resaca May 13 Sherman Johnston	Fort Steadman Mar. 25 Grant Lee
Carthage July 5 Sigel Jackson	Fair Oaks May 31 Mc Clellan Johnston	Champion Hills May 16 Grant Pemberton	Cold Harbor June 3 Grant Lee	Five Forks Apr. 1 Sheridan Lee
Rich Mountain July 11 Rosecrans Pegram	Cross Keys June 8 Fremont Ewell	Winchester June 15 Milroy Ewell	Petersburg June 18 Burnside Lee	Selma Apr. 2 Wilson Forrest
Carrick's Ford July 12 McClell'n Morris Garnett	Mechanicsville June 26 Mc Clellan Jackson Hill	Gettysburg July 1-3 Meade Lee	Atlanta Sept. 1 Sherman Hood	Petersburg Apr. 2 Grant Lee
Bull Run July 21 Mc Dowell Jackson	Gaines' Farm June 27 Porter Hill	Vicksburg July 4 Grant Pemt'n Johnston	Winchester Sept. 19 Sheridan Early	Richmond Apr. 3 Grant Davis
Wilson's Creek Aug. 10 Lyon Sigel McCulloch	Malvern Hills July 1 Porter Jackson	Port Hudson July 9 Banks Gardner	Fisher's Hill Sept. 22 Sheridan Early	Appomattox Apr. 9 Grant Lee
Carnifex Ferry Sept. 9 Rosecrans Floyd	Cedar Mountain Aug. 8 Banks Jackson	Chickamauga Sept. 19 Rosecrans Bragg	Cedar Creek Oct. 19 Sheridan Early	
Ball's Bluff Oct. 21 Baker	Antietam Sept. 17 Mc Clellan Lee	Bristow's Station Oct. 15 Meade Lee	Little Osage Rv. Oct. 25 Curtis Pleasanton Price	
Springfield Oct. 24 Fremont Thompson	Corinth Oct. 3 Rosecrans Van Dorn	Lookout Mt. Nov. 23 Hooker Bragg	Franklin Nov. 30 Schofield Hood	
Belmont Nov. 7 Grant Polk	Fredericksburg Dec. 13 Burnside Lee	Chattanooga Nov. 23 Grant Bragg	Nashville Dec. 16 Thomas Hood	
Dranesville Dec. 20 Mc Call Stuart	Murfreesboro Dec. 31 Rosecrans Bragg	Knoxville Dec. 4 Burnside Longstreet	Savannah Dec. 26 Sherman	
Miscellaneous Events: Davis President of Confederacy; England proclaimed neutrality	Iron Clad Oath Confiscation Proclamation Lee's Proclamation First issue of Greenbacks	Emancipation Proclamation Mexico made an Empire Gettysburg Speech	Grant made Lieut.-Gen'l Maximilian Emperor of Mexico Civil Wars in S. America	Thirteenth Amendment Freedman's Bureau Assassination of Lincoln Amnesty Proclamation

UNION CONFEDERATE INDECISIVE



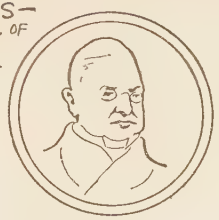
—NAPOLEON'S RUSSIAN BEAR HUNT WAS NOT AS SUCCESSFUL AS HE THOUGHT IT WOULD BE—

NAPOLEON BONAPARTE

FRENCH GENERAL

WELLINGTON

—THIERS—
FIRST PRES. OF THE THIRD REPUBLIC



EIFFEL TOWER PARIS 984 FEET HIGH

DUMAS

·CHRONOLOGICAL SUMMARY·

EVENT	DATE
CONSULATE	1799
WATERLOO	1815
RESTORATION OF LOUIS XVIII	1815
DEATH OF NAPOLEON I	1821
THE SECOND REPUBLIC	1848
CRIMEAN WAR	1854
FRANCO-GERMAN WAR	1870
THIRD REPUBLIC	1870
COLONIZATION OF WEST AFRICA	1881
FASHODA AFFAIR	1898
SEPARATION OF CHURCH & STATE	1905

—EMILE LOUBET—
SEVENTH PRESIDENT OF THE THIRD REPUBLIC

·JEAN BAPTISTE COROT·
A CELEBRATED FRENCH LANDSCAPE PAINTER

·FRANCE·
FROM THE CONSULATE TO THE PRESENT TIME.

ENGLAND SINCE THE ACCESSION OF VICTORIA

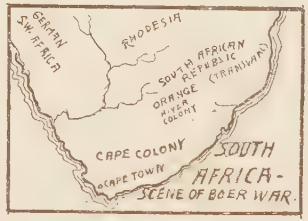
WILLIAM EWART GLADSTONE

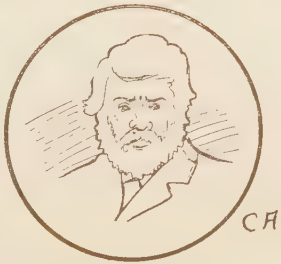
QUEEN VICTORIA

EDWARD VII OF ENGLAND

PENNY POSTAGE ESTABLISHED IN 1841

TOWER BRIDGE LONDON

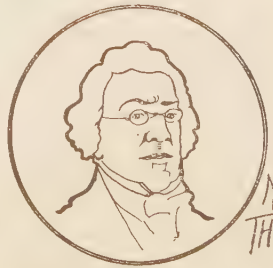




CARLYLE

CHRONOLOGICAL SUMMARY

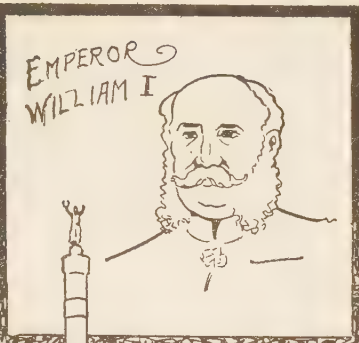
Accession of Queen Victoria	1837
Crimean War	1854
India Transferred to Crown	1858
Canadian Federation	1867
Gladstone's First Ministry	1868
Queen's Jubilee	1897
Boer War	1899
Death of Queen Victoria	1901
Edward VII King of England	1901

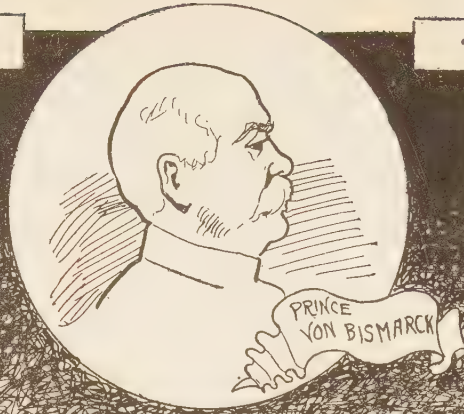


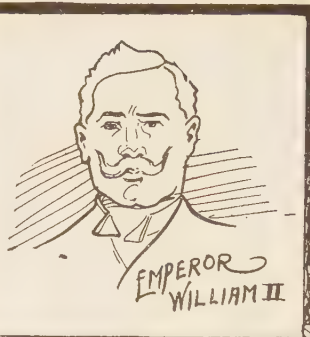
WILLIAM MAKEPEACE THACKERAY

GERMANY

AFTER 1814







THE COLUMN OF VICTORY, —BERLIN—

COMMEMORATING THE SUCCESS OF THE GERMAN ARMS —1866-1870

CHRONOLOGICAL SUMMARY

Germanic Confederation	1815
Carlsbad Decrees	1819
First German Parliament	1848
Socialism Founded	1860
Franco-German War	1870
German Empire	1870
Bismarck, Chancellor	1871
German Colonization	1884
Accession of William II	1888
Trouble in Venezuela	1903
Triumph of Socialists	1903
Revolt in S. African Colonies	1904

THE CALL TO ARMS
DETAIL FROM A PEDESTAL PIECE OF THE GERMAN NATIONAL MONUMENT

GREAT GERMAN MUSICIANS

HAYDN	SCHUMAN
MOZART	JOHN STRAUS
BEETHOVEN	R. STRUS
SCHUBERT	WAGNER

FAMOUS GERMAN WRITERS

LESSING	HEINE
GOETHE	FREYTAG
SCHILLER	SCHEFFEL
KÖRNER	VON RANKE
UHLAND	MOMMSEN
GRIMM	SUDERMAN
KANT	HAUPTMANN
HUMBOLDT	RICHTER

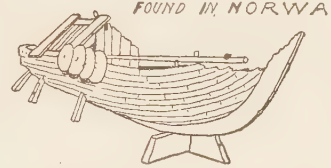
UNIFICATION OF ITALY

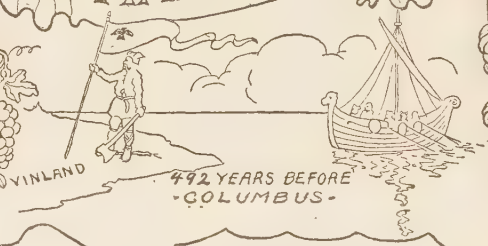
Outline

Italy under foreign rule
Growth of National Consciousness
Influence of July Revolution in Paris
Young Italy
The Revolution of 1848
The Leadership of Cavour
The War of Liberation
The Kingdom of Italy
Recent History

THE NORSEMEN IN AMERICA

REMAINS OF A VIKING SHIP FOUND IN NORWAY.



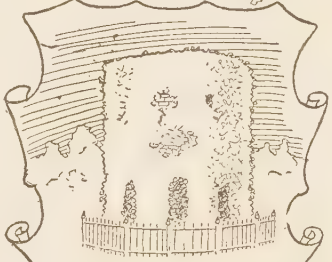


ROCK TRACING

OUTLINE

TIME } BJORN HERJULFSON – 986
PERSON } LEIF ERICSON – 1001

CAUSES – CLIMATE & PRODUCTIONS INVITING
PLACES – LABRADOR & COAST OF U.S.
EVIDENCES – ANNALS OF ICELAND & TRADITION
RESULTS – NAMED VINLAND – NOTHING PERMANENT



THE "OLD STONE MILL"

COLUMBUS

BIOGRAPHY

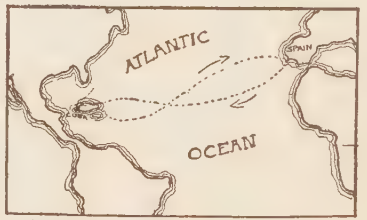
BORN: GENOA, ITALY, 1436
PARENTS POOR BUT INDUSTRIOUS
EARLY LIFE: SAILOR ON PORTUGUESE SHIP. MAP MAKER. CHARTOGRAPHER FOR COURT OF SPAIN.
LATER LIFE: ADVOCATES ROTUNDITY OF THE EARTH MEETS MARCHENA AT CONVENT OF LA RABIDA. RECEIVES AID FROM QUEEN ISABELLA.

VOYAGES

1–1492, SAN SALVADOR
2–1493, SAN DOMINGO
3–1498, COAST OF SOUTH AMERICA. RETURNED IN CHAINS.
4–1502, COAST OF CENTRAL AMERICA.

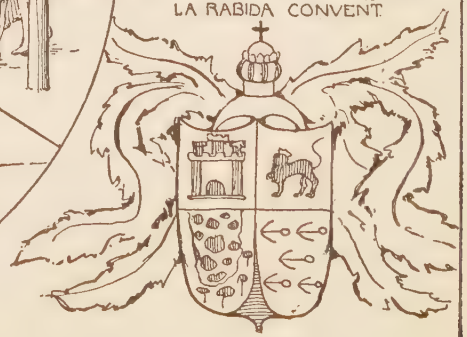
DIED; VALLADOLID, SPAIN, 1506.

1445– WHEN A BOY COLUMBUS STUDIED NAVIGATION
REARING THE CROSS IN THE NEW WORLD
OCT 12 1492 LAND DISCOVERED
AUG 3 1492
THE START
APR 17 1492 BEFORE FERDINAND AND ISABELLA
1480 THE KING OF PORTUGAL REFUSES AID



COLUMBUS'S ROUTE ACROSS THE SEA. 1492.

LA RABIDA CONVENT



Methods of Teaching History

I. Purposes.
   1. To present facts in such a manner that the principles of growth and government of nations will be established.
   2. To stimulate patriotism and all its attendant virtues.
   3. To develop the minds of pupils to imagine and grasp a situation.
   4. To train the judgment and reasoning powers.
   5. To direct the reading of pupils along supplementary lines and create a permanent choice for historical reading.
   6. To strengthen and develop character.

II. Preparation of the Teacher.
   1. A thorough knowledge of subject.
   2. A knowledge of methods of teaching.
   3. Ability to direct pupils in study.
   4. Ability to present subjects in an interesting manner.

III. Primary Grades—First, Second and Third.
   1. History stories.
   2. Biographies of great men.
   3. Stories of exploration.
   4. Patriotic songs and gems of literature.

IV. Intermediate Grades—Fourth, Fifth and Sixth.
   1. History stories.
   2. Biographies.
   3. Stories of travel.
   4. Memorizing patriotic songs and gems.

V. Grammar Grades—Seventh and Eighth.
   1. Text-books.
   2. Cause and effects.
   3. Maps.
   4. Outlines.
   5. Dates.
   6. Government.
   7. Wars.
   8. Supplementary work.

Flags

I. General Meaning of Term.

II. Uses.
   1. Primary.
      a. An emblem representing principles of government on all public occasions.
      b. To distinguish nations on land or sea.
   2. Secondary.
      a. To distinguish divisions of army in war.
      b. To denote rank of officers in army and navy.
   3. Signs or signals.
      a. Yellow flag—Quarantine.
      b. White flag—Flag of truce.
      c. Flag reversed—Sign of distress.
      d. Lower flag—Act of respect to superior officers.
      e. Half mast—mourning.

f. Signaling at sea—Code for each nation.
g. Dipping flag—Salute.
h. Powder on board—Red.

III. Flags of Nations.
1. United States.
a. Origin.
b. History of.
c. Birthday of Stars and Stripes.
Meaning of.
Stars—how and where placed?
Stripes—why alternate red and white?
Construction of.
Additional stars when?
Permanent arrangement of stars and stripes.
d. Kinds.
President's.
Admiral's.
Vice admiral's.
Rear admiral's.
Commodore's.
Revenue.
2. Foreign countries.
a. England.
b. Spain—red and yellow.
c. Germany, etc.

IV. Influences.
1. Flag Day.
2. Flag on all school houses.
3. Patriotism, etc.

QUESTIONS—FLAGS.

Were you to see a United States warship, how could you determine the rank of the officer in charge?

What flag was hoisted on Dewey's flagship in the battle of Manila Bay? Were he to command another vessel or fleet today, would the same kind of flag be hoisted?

Describe the flag displayed by Paul Jones in 1779.

Oklahoma has recently been added to the sisterhood of states; on what day after her admission was a new star added to the flag?

Who made the first American flag? Which navy first saluted the American flag?

What was the first recorded naval engagement under the flag? When were the colors first unfurled over a foreign country?

When was the flag first seen at a British port? What was the national emblem during the War of 1812?

Who wrote "The Star-Spangled Banner?" Who has the flag that inspired that song?

When did the flag have sixteen stars and fifteen stripes?

Why has our flag thirteen stripes? Who suggested the number of stripes?

When was the revenue flag created?

What was the Confederate flag like?

What is the color of the president's flag?

What flag is hoisted when powder is taken on board?

What is the color of the quarantine flag?

What is the meaning of a flag reversed?

What is the flag of truce? What does the expression mean, to "strike the flag?"

How are flags hoisted in case of mourning? What is "dipping the flag?"

When and why have stars been added to the flag?

Washington

Birth—Virginia, February 22, 1732.

Parents—Well-to-do farmers.

Education—Limited to elementary subjects. Acquired by self-study a fine knowledge of mathematics and surveying and knowledge along general lines.

Profession—Public surveyor.

Military Career—Began at age of 19. Won admiration and respect in an eminent degree in contest with French and Indians.

Revolution—Prior to Revolution he sympathized with the patriots, but counseled moderation and urged war as last resort. 1774—Elected to Continental Congress and chosen commander-in-chief of the American forces. Served throughout Revolution. Details of his campaign constitute story of Revolution. Rare skill and patience brought results.

President—1789. Chosen as president. Served two terms. Solved some of the most important problems ever presented to American government.

1. Adjustment of important diplomatic difficulties with England and France.
2. Establishment of a national mint.
3. Chartering of the first bank of the United States.
4. Assumption by the government of the national debt.
5. Admission of certain states.

Marriage—1759. Married Mrs. Martha Custis. From the close of French and indian wars to Revolution managed his estates and became one of the wealthiest men in United States.

Character—Thoughtful and studious nature. Rare tact and judgment. "First in war, first in peace, and first in the hearts of his countrymen."

Death—1799. Death occurred from illness brought on by long exposure in the saddle.

Burial—Location.

"The preservation of the sacred fire of liberty and the destiny of the republican model of government are justly considered as deeply, perhaps as finally, staked on the experiment intrusted to the hands of the American people."

—From Washington's First Inaugural Address, April 30, 1789.

Thirteen Colonies

School work too frequently is a monotonous grind to the teacher as well as the pupil. A little variety in the way of illustrative work, outline work, queer queries and other devices can be used successfully in connection with almost every subject and will inspire the pupils and change what otherwise might prove drudgery to the teacher into a happy milestone. To get away from the ordinary we suggest that the teacher this year in the study of the Thirteen Colonies have a chart prepared as outlined for the Administrations.

We present you herewith a suggestive chart for the study of Massachusetts and one quite as interesting can be made for each colony. The supplementary material furnished by the NEW PRACTICAL REFERENCE LIBRARY added to the information supplied by the regular text will enable any one to prepare interesting work.

The hundreds of questions suggested by the illustrations will keep the pupils busy and the answers will furnish the groundwork for a thorough understanding of this period of our history. The chart is not supposed to contain the information to answer the questions so much as to suggest the questions and prove a nucleus for memorizing answers.

SUGGESTIVE QUESTIONS.

Why was the "Cradle of Liberty" so styled?
When was the first printing press set up in America?
What was the first newspaper published in America?
Who was the first settler of Boston?
What city is known as the Hub of the Universe?
Why was Boston styled "The Athens of America"?
For what was the Boston Elm noted?
What was the sobriquet of Faneuil Hall?
Name two causes of Salem witchcraft,—three events, two results?
What was some of the early money used in Massachusetts?
What was the nature of the government established by the Pilgrim Fathers?
In what ship did they come to America? What was the number of emigrants? How many houses were erected by them?
What now marks the place where the Pilgrims landed?
Why were the persons who come over in the Mayflower styled Pilgrims?
Who were among the leaders of the Pilgrims? Who the first governors? What do you know of their growth? Their sufferings? Their independence?
What inscription is upon the original Plymouth Rock?
Who is the author of the poem written in honor of the landing of the Pilgrim Fathers?

The books which help you most are those which make you think the most. The hardest way of learning is by easy reading; every man that tries it finds it so.

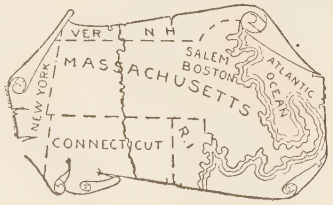
MASSACHUSETTS

PLYMOUTH ROCK

"What sought they thus afar?
Bright jewels of the mine?
The wealth of seas? the spoils of war?
They sought a faith's pure shrine."

Outline.

Time - Dec. 21, 1620.
Place - Plymouth
Why so named?
People - Pilgrims
Leaders - Bradford-Carver.
Character - Industrious
Wanderings.
Number - 102.
No. of families - 19.
Suffering
Object - Religious freedom.
Ship - Mayflower
No. of houses - 20
Governors - Carver - Bradford.
First Thanksgiving.
Growth - Very slow
Independence.



ELM TREE

SALEM WITCHCRAFT

Time - 1692.
Place - Salem, Mass.
Causes
Believed possessed of the Devil.
Sold themselves to do his bidding.
Events
Prisons filled.
Fifty-five tortured into confession!
Twenty put to death
Results
Showed the superstition of the times.
Decreased the spirit of intolerance.

PILGRIM MONUMENT

HUB OF THE UNIVERSE

MAY-FLOWER

PINE TREE SHILLING

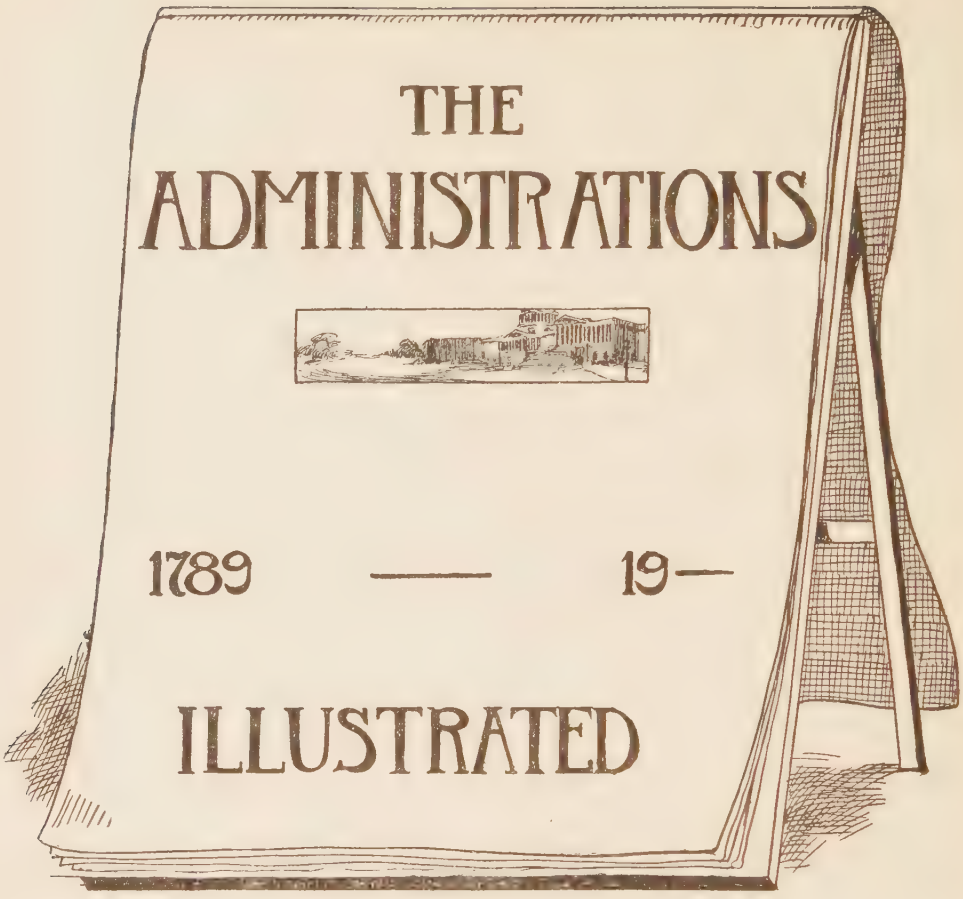
FANEUIL HALL
"CRADLE OF LIBERTY"

Roach

Discovery or Invention	Date	Discoverer or Inventor	Remarks
Cotton Gin....	1792	Eli Whitney.....	The cotton gin reduced the labor of separating the fiber from the seed; made the American cotton industry possible, and through it enabled this country to supply a large part of the cotton used throughout the world.
Steamboat	1807	Robert Fulton	Revolutionized transportation on the water; made definite time schedules possible for boats, and has reduced the time for crossing the Atlantic from several weeks to less than one week.
Use of Anthracite ..	1812	Josiah White and Erskine Hazard...	Made the use of anthracite for fuel possible; placed at the disposal of the country the vast quantity of anthracite coal, and provided a source of fuel which could be transported to all parts of the country. One of the most influential discoveries on industries.
Reaping Machine	1834	C. H. McCormick...	This machine is doubtless the most useful of agricultural inventions. It reduced the labor of harvesting to such an extent as to make possible the great farms in the grain growing regions of the world.
Telegraph	1837	S. F. B. Morse.....	Made possible almost instant communication between distant points. Its influence upon commerce is beyond measure.
Screw Propeller ...	1839	John Ericsson.....	This device perfected the steamboat and changed the plan of ocean steamers, resulting ultimately in the modern ocean liner.
Use of Ether	1842	Dr. C. W. Long.....	This relieved the pain and distress attendant upon surgical operations, and has made modern surgery possible.
Submarine Cable	1842	S. F. B. Morse.....	This is but another application of the telegraph. Its use practically brings all parts of the world together, making it possible to communicate within a few minutes with points thousands of miles away.
Sewing Machine	1846	Elias Howe.....	This machine was to the manufacture of clothing what the reaper was to the harvesting of grain. It made the factory system of manufacturing clothing possible.
Petroleum	1853	Dr. Brewer.....	The discovery of petroleum as an illuminant practically changed the methods of illumination throughout the country, producing a useful and strong illuminant at such a price as to bring it within the reach of all.
Typewriter	1868	Chas. L. Shoals.....	The typewriter is an important invention for business purposes. Its use has practically changed the methods of correspondence and greatly systematized the office methods.
Telephone	1876	Alex. G. Bell.....	The telephone has made it possible to converse at long distances. In a great measure it has taken the place of the telegraph, and in cities and towns has become indispensable to the transaction of business.

THE ORIGINAL THIRTEEN COLONIES

Colony	Date	Place	Motive	Settlers	Livelihood	Government
Virginia	1607	Jamestown	Wealth	Eng. Adventurers	Corn, Tob. Slaves	C.C.-R.-Prop.-R.
New York	1613	New York	Trade	Dutch	Furs	C.C.-Prop.-R.
Massachusetts	1620	Plymouth	Religion	Separatists, Puritans	Agri. Fishing	Dem.-Char.-R.
N. Hampshire	1623	Portsmouth	Trade	Col. from Mass.	Agri. Fish. Lum	Prop.-Prov.-R.
Maryland	1634	St. Marys	Religion	Roman Catholics	Agri. Mfg. Min.	Prop.-R.-Prop.
Connecticut	1635	Windsor	Agri. & Rel.	Colonists, Puritans	Agri Mfg	Dem.-Char.-R.
Rhode Island	1636	Providence	Religion	Dissenters	Agri. Fishing	Dem.-Char.-R.
Delaware	1638	Wilmington	Agriculture	Swedes, Quakers	Agriculture	Dem.-Prov.-Prop.
N. Carolina	1640-63	Albemarle Sd.	Ag. & Pol. Strife	Refugees, Huguenots	Rice, Tar, Turp.	Prop.-Roy.
New Jersey	1664	Elizabethtown	Agriculture	Dutch, Quakers	Agriculture	Prop.-R.
S. Carolina	1670	Charleston	Agri. Rel. & Pol.	Refugees, Huguenots	Cotton, Rice, Silk	Prop.-R.
Pennsylvania	1682	Philadelphia	Religion	Quakers	Ag. Mfg. Min.	Prop.-R.-Prop.
Georgia	1733	Savannah	Philanthrophy	Scotch & Poor	Cotton	Prop.-R.



The Administrations

The administrations include the most important period of our history, yet because of the way in which this portion of the subject is usually treated in school, it often lacks interest to the pupils and fails to awaken in them any enthusiasm or love for the subject. The period spent upon the study of the administrations varies from three to five months in most schools. How many times have you taken your class over this period of history? At the end of the study how many of your pupils can name the most important events of each administration? For instance, how many can tell in whose administration the Embargo Act was passed; Louisiana was purchased; Texas was admitted; or the War of 1812 occurred? How many of them know what the Omnibus Bill was; what it contained; why it was considered important? How many can tell in whose administration the statue of *Liberty Enlightening the World* was erected in New York harbor, and how many know by whom and why the statue was erected? These questions simply serve to call your attention to the classes of events which are especially significant, and which pupils should not only remember but understand.

In treating this period of history have you usually followed the old text-book routine? If so, why not make a radical departure? Instead of assigning lessons page for page, give the class a single administration to study; ask them to pick

out and make a list of the important events as they see them. Then ask each pupil to make a drawing, however crude, which will represent to him one or two events which he considers the most significant. Gather these drawings in the recitation, and then, either with or without the aid of some of the pupils, make a blackboard chart representing the events which should receive the most emphasis. Doubtless the first attempt will show that the drawings can be rearranged to good advantage. When this has been done, the class is in position to construct a chart of this administration.

For the purpose of making such a chart, secure heavy manila paper of good grade, about 28x36 inches in size. For coloring matter use either black water color paint, India ink or common ink. If the last is used, it should be thickened by adding a little mucilage. A small camel's-hair brush used with the water colors is the best instrument for making the drawings or lettering. However, a rubber pen is useful in lettering. Choose a border which will be tasteful and then let the chart be the outgrowth of the pupils' work. Doubtless several members of the class can work on it to advantage. One may be more skillful than others in lettering; such a one can do the lettering. Another may have more skill in making portraits; if so, he might make a portrait of the president, placing it in suitable position on the page, and so on. The chief point is that the pupils shall feel that the chart is their work. When you have completed one administration, take another and proceed in this way until this period of the history has been covered.

You will find that this method will inject enthusiasm into what has heretofore, to many of your pupils at least, been a trying and uninteresting subject. Save the charts and when they are all completed paste strong cloth on the upper edge of each sheet; paste or sew these strips of cloth together so as to form a mounting, and attach them to a frame similar to that shown in the illustration. The sketches which follow show what can be done and something of the wealth of material supplied by The New Practical Reference Library for this work.

The first sketch, *Our First President,* is given in a simple color scheme for the purpose of illustrating what your pupils can do if they wish to illuminate these charts by using different colors. If they have access to water colors, of course the coloring is made very easy, though these are somewhat more expensive than colored crayons. On a paper with a rough surface the colored crayons, obtainable at slight expense from any school-supply house, can be used to very good advantage. This reference to colored crayons of course is to those crayons designed for use on paper and not to the cheap colored crayons often used in blackboard work.

QUESTIONS.

What were the three important features of President Johnson's idea of reconstruction?

What additional requirements were imposed by Congress?

What is an appropriate epitaph for Lincoln's tomb?

In what year was Nebraska admitted into the Union?

Name four important laws passed while Johnson was President.

How many men took part in the Grand Review? How long did it last? How did the soldiers march? When did it occur?

What ended the dream of French dominion in the New World?

The northern office seekers who went South at the close of the Civil War were designated by what title?

What two words express the thought of the Thirteenth Amendment? Of the Fourteenth?

What vessel was used in successfully laying the Atlantic Cable?

No.	President.	State.	Born.	Died.	Term of Office.	Political Party.	Vice-President.
1	George Washington...	Virginia	1732	1799	Two Terms; 1789-1797.....	Federalists	John Adams.
2	John Adams	Massachusetts	1735	1826	One term; 1797-1801.....	Federalists	Thomas Jefferson.
3	Thomas Jefferson.....	Virginia	1743	1826	Two terms; 1801-1809.....	Democratic-Republicans ...	Aaron Burr. George Clinton.
4	James Madison	Virginia	1751	1836	Two terms; 1809-1817.....	Democratic-Republicans ...	George Clinton. Elbridge Gerry.
5	James Monroe	Virginia	1758	1831	Two terms; 1817-1825.....	Democratic-Republicans ...	Daniel D. Tompkins.
6	John Quincy Adams[2]..	Massachusetts	1767	1848	One term; 1825-1829.....	Loose Constructionists	John C. Calhoun.
7	Andrew Jackson	Tennessee	1767	1845	Two terms; 1829-1837.....	Democrats	John C. Calhoun. Martin Van Buren.
8	Martin Van Buren ...	New York.....	1782	1862	One term; 1837-1841.....	Democrats	Richard M. Johnson.
9	William H. Harrison[1].	Ohio	1773	1841	One month; 1841.....	Whigs	John Tyler.
10	John Tyler	Virginia	1790	1862	3 years and 11 months; 1841-1845....	Whigs	
11	James K. Polk.....	Tennessee	1795	1849	One term; 1845-1849.....	Democrats	George M. Dallas.
12	Zachary Taylor[1].....	Louisiana	1784	1850	1 year and 4 months; 1849-1850.....	Whigs	Millard Fillmore.
13	Millard Fillmore	New York.....	1800	1874	2 years and 8 months; 1850-1853.....	Whigs	
14	Franklin Pierce	N. Hampshire..	1804	1869	One term; 1853-1857.....	Democrats	William R. King.
15	James Buchanan	Pennsylvania ..	1791	1868	One term; 1857-1861.....	Democrats	J. C. Breckenridge.
16	Abraham Lincoln[1]	Illinois	1809	1865	One term and 6 weeks; 1861-1865....	Republicans	Hannibal Hamlin. Andrew Johnson.
17	Andrew Johnson	Tennessee	1808	1875	3 years and 10½ months; 1865-1869..	Republicans	
18	Ulysses S. Grant.....	Illinois	1822	1885	Two terms; 1869-1877.....	Republicans	Schuyler Colfax. Henry Wilson.
19	Rutherford B. Hayes..	Ohio	1822	1893	One term; 1877-1881.....	Republicans	William A. Wheeler.
20	James A. Garfield[1]....	Ohio	1831	1881	Six months and 15 days.....	Republicans	Chester A. Arthur.
21	Chester A. Arthur....	New York.....	1830	1886	3 years, 5 months, 15 days; 1881-1885.	Republicans	
22	Grover Cleveland	New York.....	1837	1908	One term; 1885-1889.....	Democrats	Thomas A. Hendricks.
23	Benjamin Harrison....	Indiana	1833	1901	One term; 1889-1893.....	Republicans	Levi P. Morton.
24	Grover Cleveland.....	New York.....	1837	1908	One term; 1893-1897.....	Democrats	Adlai E. Stevenson.
25	William McKinley[1]....	Ohio	1843	1901	One term and 6 months; 1897-1901...	Republicans	Garret A. Hobart.[1] Theodore Roosevelt.
26	Theodore Roosevelt....	New York	1858	....	One term, 3 years, 6 months; 1901-1909	Republicans	Charles W. Fairbanks.
27	William H. Taft.....	Ohio	1857	....	.....	Republicans	James S. Sherman.

[1] Died in office. [2] Elected by House of Representatives.

OUR FIRST PRESIDENT

1789

1797

FOREIGN AFFAIRS
French trouble
Citizen Genet
Jay's treaty
Mississippi treaty
Treaty with Algeria
Greenville treaty
English Order in Council

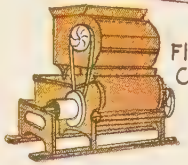
DOMESTIC AFFAIRS
Amendments
Inventions
Naturalization
Census
Tariff
Slavery
Finances
Rebellions

BIRTH
PARENTAGE
EDUCATION
MARRIAGE
CHARACTER
DEATH

BIRTH
PARENTAGE
EDUCATION
MARRIAGE
CHARACTER
DEATH

MISSISSIPPI RIVER

BENJAMIN FRANKLIN
BORN 1706
DIED 1790



FIRST COTTON GIN

Treaty
$800,000 Ransom
100,000 Vessel
23,000 Annual Tribute

ALGERIA

D·C·

Washington

Ratifies Constitution R·I·

Citizen Genet
Proclamation of Neutrality
FRANCE
First Revolution

"Dark & Bloody Ground"
KENTUCKY
~1792~

"River with the Great Bend"
TENNESSEE
~1796~

GREEN MOUNTAIN
VERMONT
1791

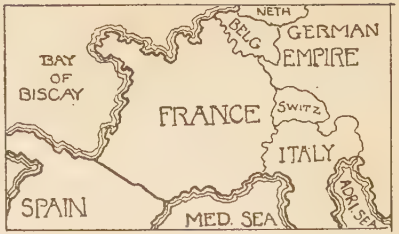
Whiskey Insurrection
Anthracite Coal Discovered
PENNSYLVANIA
Indian Wars
Mint
Bank
Turnpike
Capital

OPEN TO COMMERCE 1796

"Providence left him childless, that his country might call him father."

1797 ADAMS 1801 ADMINISTRATION

FIRST IN WAR, FIRST IN PEACE AND FIRST IN THE HEARTS OF HIS COUNTRYMEN



MILLIONS FOR DEFENSE BUT NOT ONE CENT FOR TRIBUTE

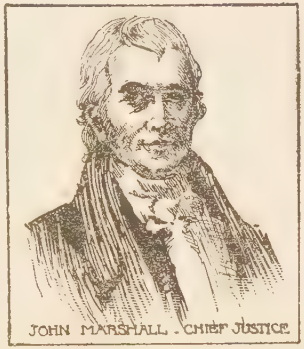
ALIEN LAW

THE PRESIDENT COULD EXPEL FROM THE COUNTRY ANY FOREIGNER WHOM HE DEEMED INJURIOUS TO THE UNITED STATES

CONGRESS HALL, PHILADELPHIA
CAPITOL 1790-1800

SEDITION LAW

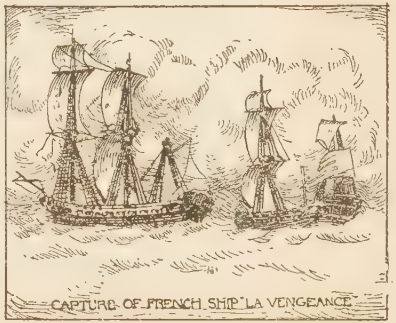
ANYONE LIBELING CONGRESS THE PRESIDENT OR THE GOVERNMENT COULD BE FINED OR IMPRISONED



JOHN MARSHALL - CHIEF JUSTICE

KENTUCKY AND VIRGINIA RESOLUTIONS

DECLARED THE ALIEN AND SEDITION LAWS UNCONSTITUTIONAL
ASSERTED THE DOCTRINE OF STATES RIGHTS



CAPTURE OF FRENCH SHIP "LA VENGEANCE"

1801 JEFFERSON'S ADMINISTRATION 1809

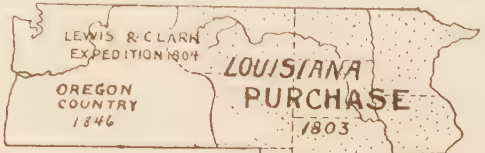
TRIPOLITAN WAR

TIME-1801-5
1801-TRIPOLI DECLARED WAR
1803-NAVAL FORCE IN MED. SEA
PHIL FOUND & CAPTURED
CREW TREATED AS SLAVES
1804-DECATUR CAPT & BURNED PHIL.
COMPREBLE BOMBARDED TRIPOLI
1805-TROUBLE CEASED
BASHAW GLAD TO MAKE TREATY

FULTON'S CLERMONT 1807

WEEHAWKEN →
FAMOUS DUELING GROUND. HAMILTON & HIS SON FELL HERE. BURR-HAMILTON-1804.

ORDERS IN COUNCIL



PURCHASE OF LOUISIANA

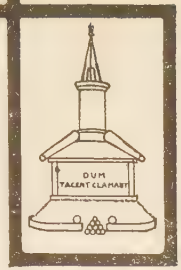
FROM-NAPOLEON
BY WHOM-LIVINGSTON & MONROE
CAUSE-
1-EXTREMITY OF NAPOLEON
2-TO PREVENT ENGLAND GETTING IT.
3-TO MAKE THE UNITED STATES A RIVAL OF ENGLAND
OBJECT-
1-TO OPEN THE MISS. RIVER TO THE WESTERN COMMERCE.
2-TO EXTEND THE TERR. OF THE U.S.
TERMS-ABOUT 15,000,000 DOLLARS
INCIDENTS-
RESULTS-
1-TERR OF THE U.S. MORE THAN DOUBLED
2-STRENGTHENED SLAVE TERR. AND GAVE RISE TO THE MO COMPROMISE

FOREIGN AFFAIRS

1806 ENGLAND ORDERS IN COUNCIL
NAPOLEON-MILAN DECREE
EMBARGO ACT "TERREPIN POLICY"
CHESAPEAKE FIRED ON
1809-NON INTERCOURSE LAW PASSED

DOMESTIC AFFAIRS

1801-FIRST WRITTEN MESSAGE TO CONGRESS
ARMY & NAVY REDUCED.
EXCISE TAKEN FROM WHISKEY
1808-SLAVE TRADE PROHIBITED



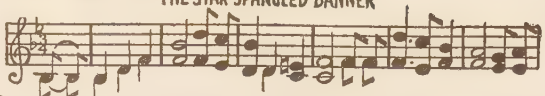
MONUMENT, NEW ORLEANS

JAMES MADISON

1809 — 1817

AMERICAN SOLDIER

THE STAR SPANGLED BANNER



OH, SAY CAN YOU SEE BY THE DAWN'S EARLY LIGHT WHAT SO PROUDLY WE HAILED

HARTFORD CONVENTION

I-TIME
III-PLACE
IIII-MEMBERS
IV-RESOLUTIONS
V-RESULTS

DESTRUCTION OF THE GUERRIERE BY THE CONSTITUTION

WAR OF 1812

I-TIME
II-CAUSE
III-ACTS & EVENTS (INFLUENCING)
IV-GENERALS IN CHIEF
V-CAMPAIGNS & EVENTS
VI-RESULTS

SEAL OF INDIANA

SEAL OF LOUISIANA

PEACE FOR THIRTY YEARS

1817 JAMES MONROE 1825

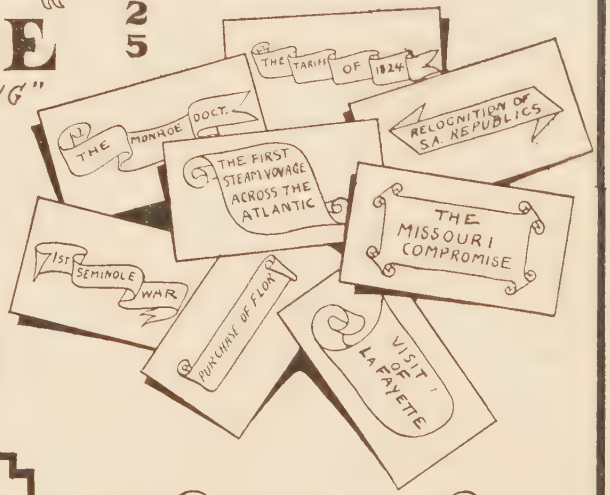
"ERA OF GOOD FEELING"

STATES ADMITTED

FLORIDA PURCHASE

TIME - 1819
AREA - 59000 SQ. MI.
FROM - SPAIN
COST - $5,000,000
OCCASION FOR ?

IMPORTANT EVENTS



Missouri Compromise

TIME 1820
AUTHORS
STATEMENT
RESULT

LAFAYETTE AT THE TOMB OF WASHINGTON

"THE NATION'S GUEST"

Monroe Doctrine

TIME - 1823
CAUSE
STATEMENT
RESULT

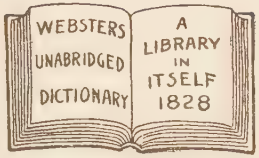
1825 "THE WALKING VOCABULARY" "THE OLD MAN ELOQUENT"

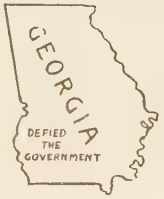
J·Q·ADAMS' ADMINISTRATION

1829 "THIS IS THE LAST OF EARTH" "TALENT, OPPORTUNITY, EFFORT, RESULTS."

JEFFERSON
JULY 4, 1826.

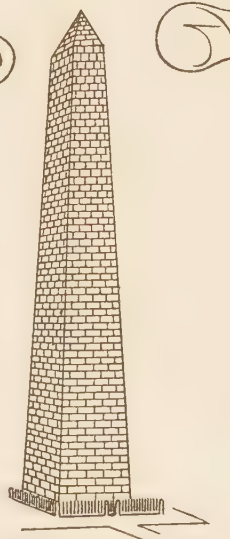
ADAMS
JULY 4, 1826.





IMPORTANT EVENTS

1825-BUNKER HILL
ERIE CANAL OPENED
1826-DEATH OF JOHN ADAMS
DEATH OF JEFFERSON
DISAPPEARANCE OF MORGAN
1827-FIRST RAILWAY
1828-BILL OF ABOMINATIONS
WEBSTERS DICTIONARY



BUNKER HILL MONUMENT

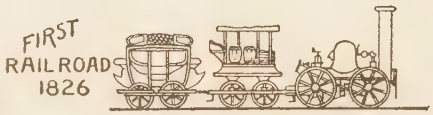
NEW POLITICAL PARTIES

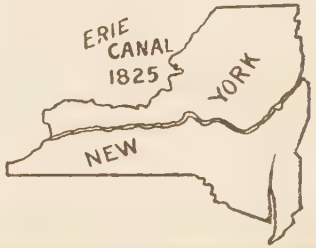
NATIONAL REPUBLICAN

I-TIME-1825-35
III-PRINCIPLES
PUBLIC IMPROVEMENT
PROTECTIVE TARIFF
NATIONAL BANK
IIII-LEADERS
CLAY
ADAMS
WEBSTER
IIII-PRESIDENT-
ADAMS.

ANTI MASONIC

I-TIME-1827
III-PLATFORM
SUPPRESSION OF MASONRY.
OPPOSITION TO SECRET SOCIETIES
IIII-PRESIDENTIAL CANDIDATE
-WILLIAM WIRT-
IIII-INFLUENCE
CONTROLLED N.Y. ELECTIONS-





THE FIVE IMPORTANT EVENTS

1829 **JACKSON** 1837

OLD HICKORY

CHICAGO IN 1832

THE FIRST HARVESTER

SPOILS SYSTEM

"TO THE VICTORS BELONG THE SPOILS"

ROTATION IN OFFICE
KITCHEN CABINET
POCKET VETOES

ANTI SLAVERY MOVEMENT

NEW ENGLAND ANTI SLAVERY SOCIETY ORGANIZED

"THE LIBERATOR"
GARRISON

U·S·BANK

CHARTER VETOED
SPECULATION
SPECIAL CIRCULAR

STATE BANKS

"Pet Banks"

THOS BENTON

NULLIFICATION

RESISTANCE OF NATIONAL LAW

FORCE ACT

GAG RULE

THE "BLOODY BILL"

OTHER EVENTS

INDEPENDENCE OF MEXICO
MORMONISM ESTABLISHED
DEATHS OF MONROE & MADISON

TREATY WITH BRAZIL
TEXAS DECLARES INDEPENDENCE
GREAT FIRE IN NEW YORK
CHOLERA VISITS U.S.
ARK. & MICH ADMITTED

LITERARY

RISE OF AMERICAN LITERATURE AND CHEAP NEWSPAPERS

BRYANT-WHITTIER
HAWTHORNE-IRVING
LONGFELLOW-COOPER
EMERSON-HOLMES
-POE-

N.Y. SUN FOUNDED
N.Y. HERALD FOUNDED

ALAMO

VAN BUREN'S ADMINISTRATION

·1837-1841·

THE ALTON RIOTS ·1837·

THE GREAT FINANCIAL PANIC ···· OF 1837 ···· THE SUBTREASURY SYSTEM · ESTABLISHED ·

6TH CENSUS-POP-17,069,453 ·1840·

FIRST PHOTOGRAPH TAKEN IN AMERICA··· ·1839·

MAGNETIC TELEGRAPH PATENTED-1837-

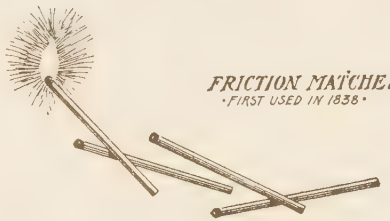
THE CANADIAN REBELLION ·1837·

SUBTREASURY BILL PASSED ·1840·

CHEROKEE INDIANS REMOVED TO INDIAN TERRITORY ·1838·

PROCESS OF VULCANIZING RUBBER DISCOVERED IN ·1839·

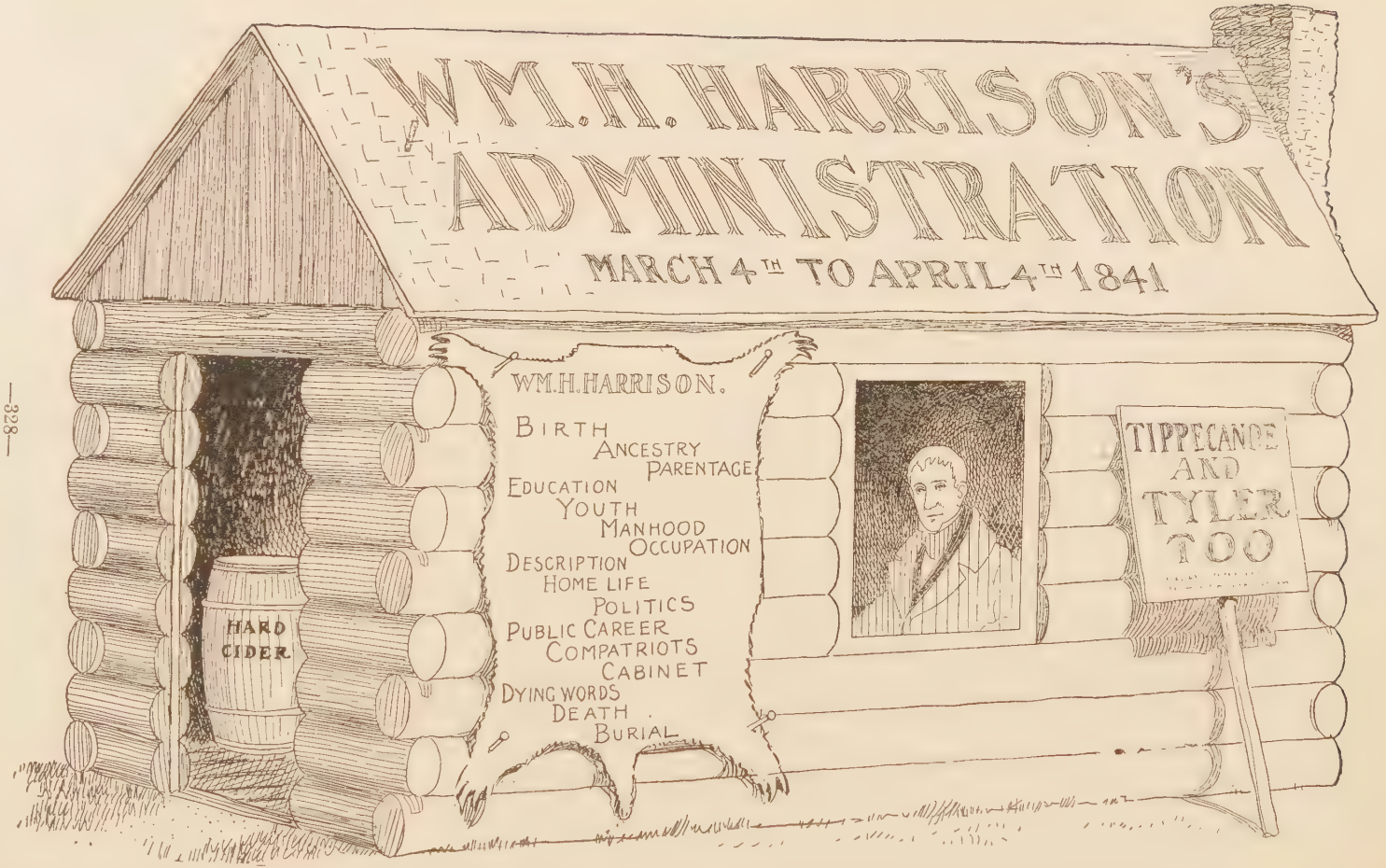
FIRST NORMAL SCHOOL OPENED IN MASS. ·1839

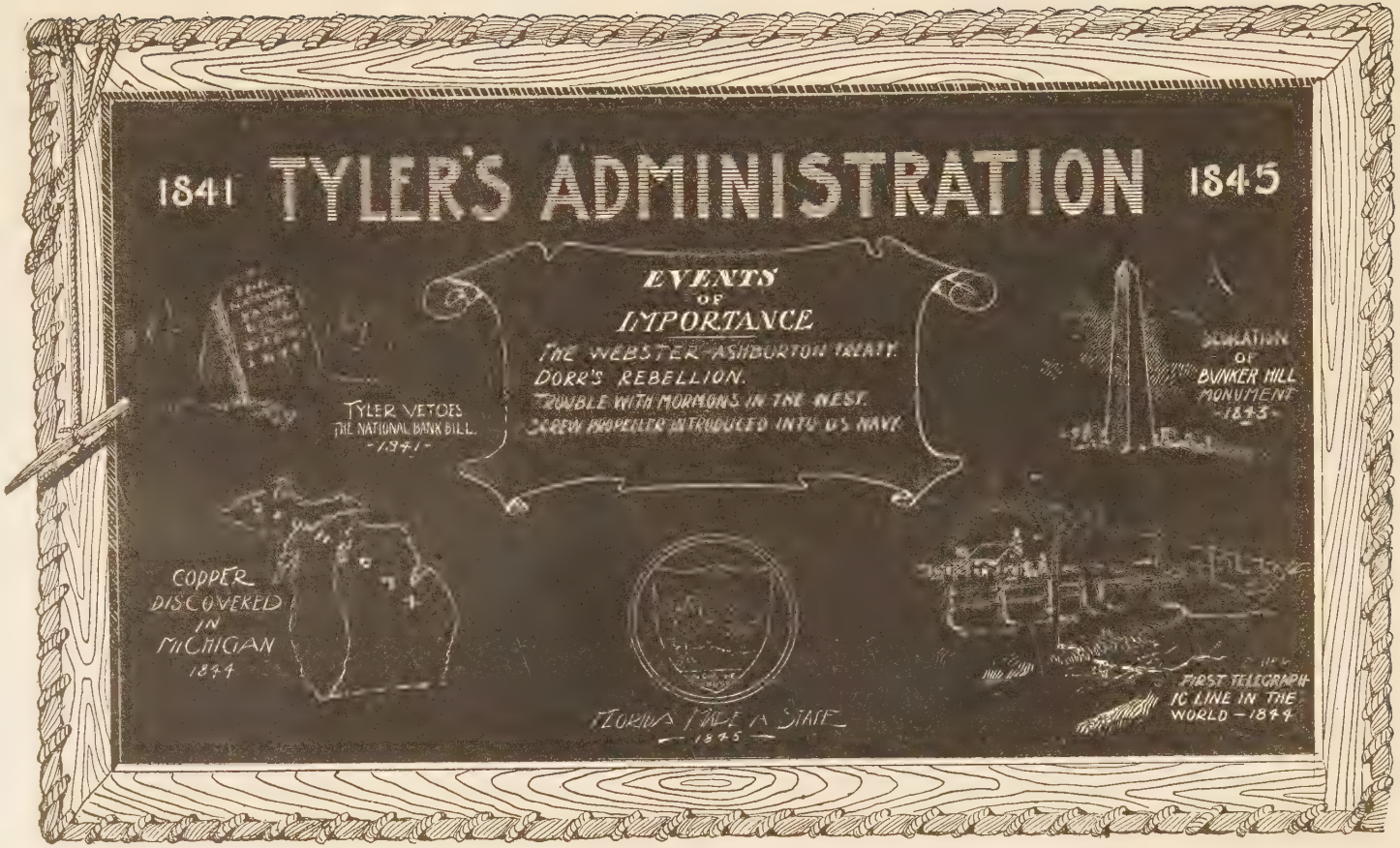


FRICTION MATCHES ·FIRST USED IN 1838·

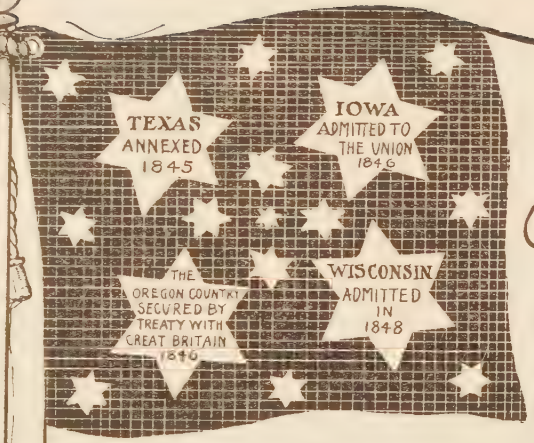
THE SEMINOLE WAR

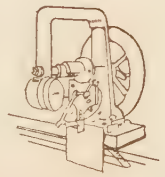
VICTORIA CROWNED


WM. H. HARRISON'S
ADMINISTRATION
MARCH 4TH TO APRIL 4TH 1841
WM. H. HARRISON.
BIRTH
ANCESTRY
PARENTAGE
EDUCATION
YOUTH
MANHOOD
OCCUPATION
DESCRIPTION
HOME LIFE
POLITICS
PUBLIC CAREER
COMPATRIOTS
CABINET
DYING WORDS
DEATH
BURIAL
HARD CIDER
TIPPECANOE AND TYLER TOO

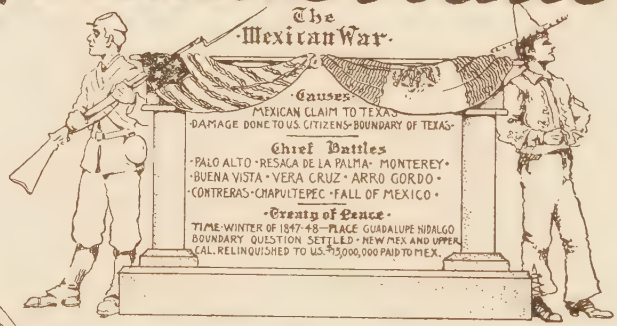

1841 TYLER'S ADMINISTRATION 1845
EVENTS OF IMPORTANCE
THE WEBSTER-ASHBURTON TREATY.
DORR'S REBELLION.
TROUBLE WITH MORMONS IN THE WEST.
SCREW PROPELLER INTRODUCED INTO U.S. NAVY.
TYLER VETOES THE NATIONAL BANK BILL. -1841-
DEDICATION OF BUNKER HILL MONUMENT -1843-
COPPER DISCOVERED IN MICHIGAN 1844
FLORIDA MADE A STATE 1845
FIRST TELEGRAPH IC LINE IN THE WORLD -1844

1845 Polks— 1849 Administration


TEXAS ANNEXED 1845
IOWA ADMITTED TO THE UNION 1846
THE OREGON COUNTRY SECURED BY TREATY WITH GREAT BRITAIN 1846
WISCONSIN ADMITTED IN 1848



SEWING MACHINE
INVENTED BY HOWE-1845-


The Mexican War
Causes
MEXICAN CLAIM TO TEXAS
DAMAGE DONE TO U.S. CITIZENS-BOUNDARY OF TEXAS-
Chief Battles
PALO ALTO · RESACA DE LA PALMA · MONTEREY ·
BUENA VISTA · VERA CRUZ · ARRO GORDO ·
CONTRERAS · CHAPULTEPEC · FALL OF MEXICO ·
Treaty of Peace
TIME-WINTER OF 1847-48—PLACE GUADALUPE HIDALGO
BOUNDARY QUESTION SETTLED · NEW MEX AND UPPER CAL. RELINQUISHED TO U.S. $15,000,000 PAID TO MEX.

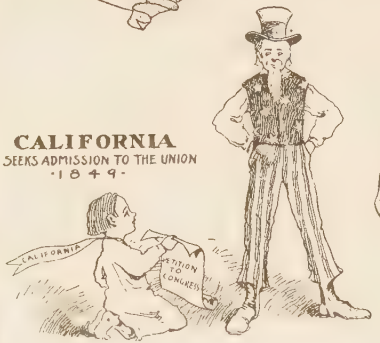
HAPPENINGS

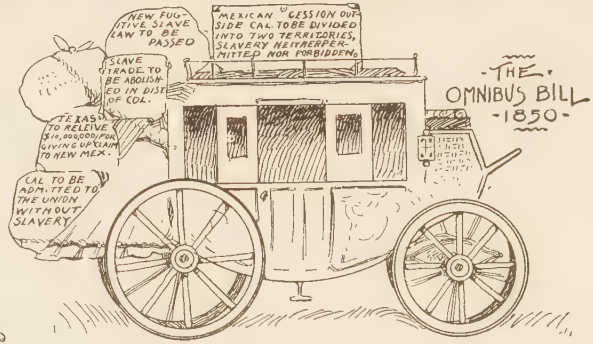
NAVAL SCHOOL FOUNDED AT ANNAPOLIS-1845-
SMITHSONIAN INSTITUTE ESTABLISHED-1846-
1ST OPERATION PERFORMED BY USE OF ETHER-1846-
HOE CYLINDER PRINTING PRESS INVENTED 1847-
SALT LAKE CITY FOUNDED-1849-

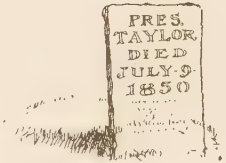
TAYLOR'S ADMINISTRATION

1849

1850

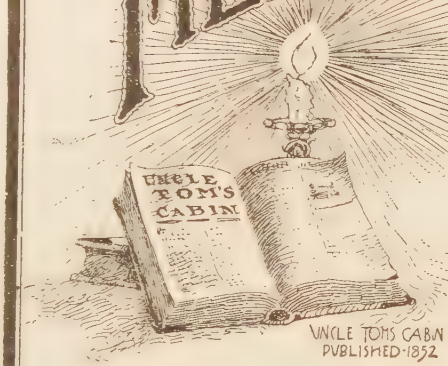



NEW FUGITIVE SLAVE LAW TO BE PASSED
MEXICAN CESSION OUTSIDE CAL. TO BE DIVIDED INTO TWO TERRITORIES, SLAVERY NEITHER PERMITTED NOR FORBIDDEN.
SLAVE TRADE TO BE ABOLISHED IN DIST OF COL.
TEXAS TO RECEIVE $10,000,000 FOR GIVING UP CLAIM TO NEW MEX.
CAL TO BE ADMITTED TO THE UNION WITHOUT SLAVERY
-THE-
OMNIBUS BILL
-1850-



THE OVERLAND ROUTE TO CALIFORNIA

FILLMORE'S ADMINISTRATION 1850-1853



UNCLE TOMS CABN
PUBLISHED·1852

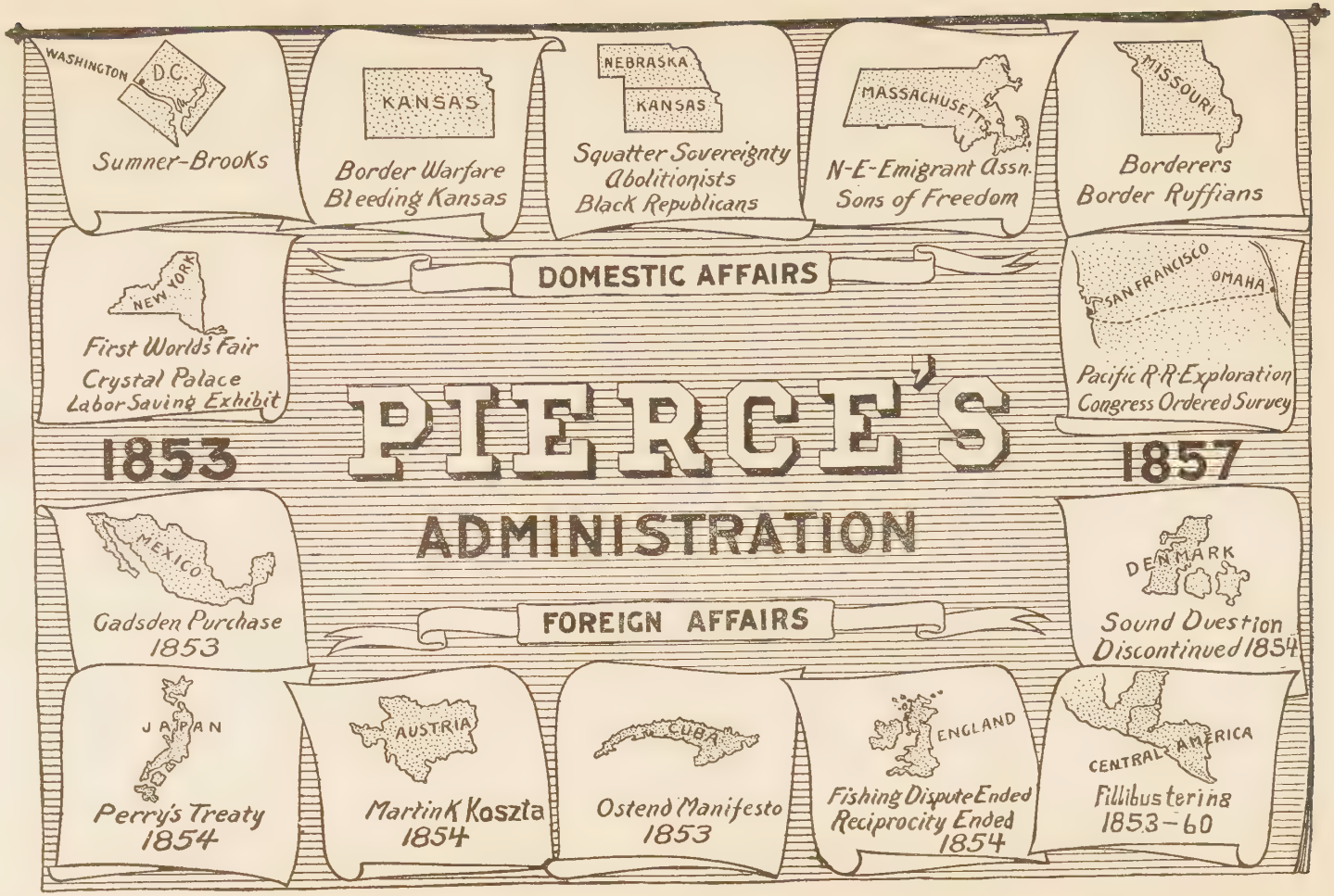
·IMPORTANT EVENTS·

PACIFIC RAILWAY SURVEYS ORDERED·1853·
HUNGARIAN PATRIOT KOSSUTH SEEKS AID IN UNITED STATES
·1852·

MANY ARCTIC EXPEDITIONS SENT OUT

MAINE LAW PASSED
(1ST TEMPERANCE LAW)
·1851·

"THE UNDERGROUND ·RAILWAY·"
GUIDING A RUNAWAY NEGRO TO THE NEXT "STATION"


WASHINGTON D.C.
Sumner-Brooks
KANSAS
Border Warfare
Bleeding Kansas
NEBRASKA
KANSAS
Squatter Sovereignty
Abolitionists
Black Republicans
MASSACHUSETTS
N-E-Emigrant Assn.
Sons of Freedom
MISSOURI
Borderers
Border Ruffians
DOMESTIC AFFAIRS
NEW YORK
First World's Fair
Crystal Palace
Labor Saving Exhibit
SAN FRANCISCO
OMAHA
Pacific R.R. Exploration
Congress Ordered Survey
1853
PIERCE'S
1857
ADMINISTRATION
MEXICO
Gadsden Purchase
1853
FOREIGN AFFAIRS
DENMARK
Sound Duestion
Discontinued 1854
JAPAN
Perry's Treaty
1854
AUSTRIA
Martin K Koszta
1854
CUBA
Ostend Manifesto
1853
ENGLAND
Fishing Dispute Ended
Reciprocity Ended
1854
CENTRAL AMERICA
Fillibustering
1853-60

Buchanan's Administration

1857

1861

MINNESOTA BECOMES A STATE – 1858 –

OREGON ADMITTED TO THE UNION – 1859 –

KANSAS ADMITTED AS A STATE – 1860 –

CONFEDERATE STATES ORGANIZED IN 1861 –

• JOHN BROWN'S RAID AT HARPER'S FERRY • –
1859

• DRED SCOTT DECISION • 1857 •

•• OTHER IMPORTANT EVENTS ••

FINANCIAL PANIC - 1857

LAYING OF THE ATLANTIC CABLE - 1857

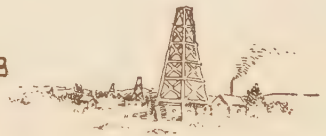
LINCOLN - DOUGLAS DEBATES - 1858

COMSTOCK LODE DISCOVERED - 1858

MORMONS AT UTAH OVERPOWERED - 1858

8TH CENSUS - POP. 31,443,321 - 1860

• SECESSION OF SOUTH CAROLINA - 1860 •

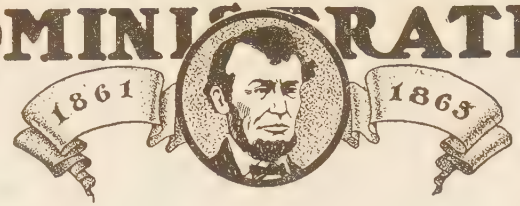


• OIL DISCOVERED IN PENNSYLVANIA •
• 1859 •

LINCOLN'S ADMINISTRATION

NEVADA ADMITTED TO THE UNION-1864

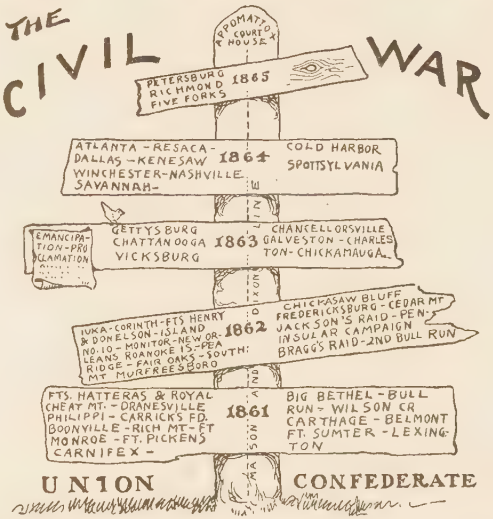
WEST VIRGINIA ADMITTED TO THE UNION-1863-

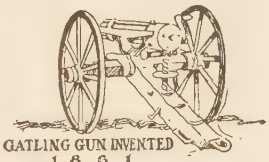


VASSAR COLLEGE
·FOUNDED 1861·

THE SIOUX WAR 1862-63

THE CIVIL WAR





GATLING GUN INVENTED 1861

FREE MAIL DELIVERY IN LARGE CITIES ESTABLISHED-1863

·EVENTS·

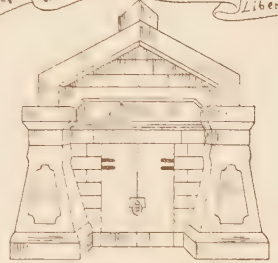
GROUNDS PURCHASED FOR NAT. CEMETERIES-1861
ADDITIONAL TAXES TO PROVIDE FOR WAR 1861
HOMESTEAD LAW - 1861·
BUREAU OF AGRICULTURE FOUNDED 1862
PAC. RR. & TEL. AUTHORIZED - 1862-
THE ANTI-POLYGAMY ACT - 1862·

EVENTS

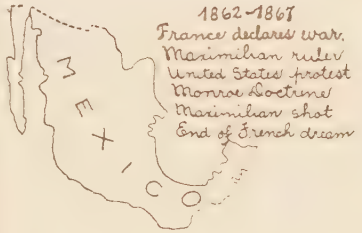
FIRST ISSUE OF GREENBACKS-1862
CONSCRIPTION ACT - 1863
NATIONAL BANK FOUNDED-1863
EMANCIPATION PROCLAMATION-1863
POSTAL MONEY ORDER SYSTEM EST. 1864
THE PHILADELPHIA FAIR-1864·

1865 JOHNSON'S ADMINISTRATION 1869

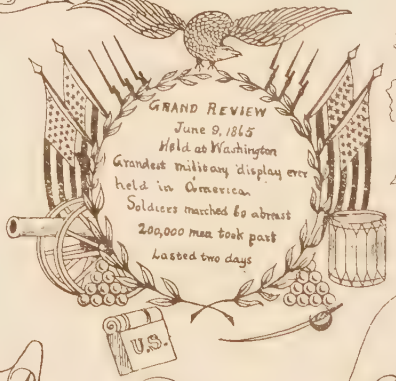
"Here sleeps the Apostle of Human Liberty"

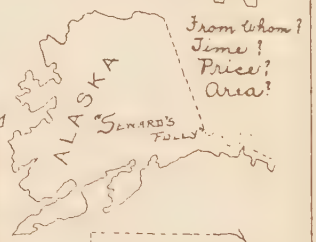


LINCOLN'S TOMB



1862–1867
France declares war.
Maximilian ruler
United States protest
Monroe Doctrine
Maximilian shot
End of French dream





From whom?
Time?
Price?
Area?

Laws
Freedman's Bureau
Civil Rights
Tenure of Office
Amnesty Proclamation

Reconstruction
Presidency
1 Repudiate Act of Secession
2 Repudiate Confederate debt
3 Ratify XIII Amendment

Congress
1. Repudiate Ordin. of Secession
2. Ratify XIII & XIV Am'ts
3. Finally ratify XV Amendment

CARPET BAGGERS

Amendments
XIII Anti Slavery
XIV Equal Rights

GREAT EASTERN

Launching lasted nearly 5 mo. Cost 60,000 £
Length 680 ft. Breadth 118 ft. Height 70 ft. Launched 1858
8 Engines 11,000 Horse power Sold 1885 for $126,000

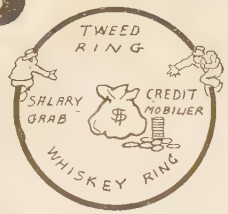
ATLANTIC CABLE

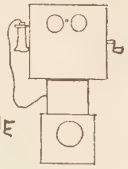
Success due to energy of Cyrus W. Field
1857 First attempt Cable parted 1858 Second attempt. Success
1865 Great Eastern successfully accomplished the work.

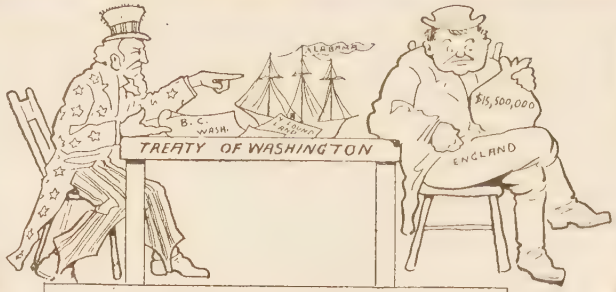
Rand

1869 UNCONDITIONAL SURRENDER LET US HAVE PEACE 1877

GRANT'S ADMINISTRATION

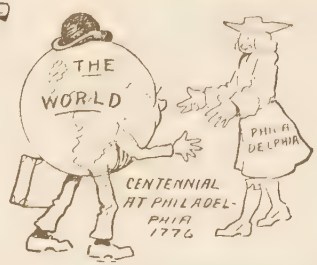


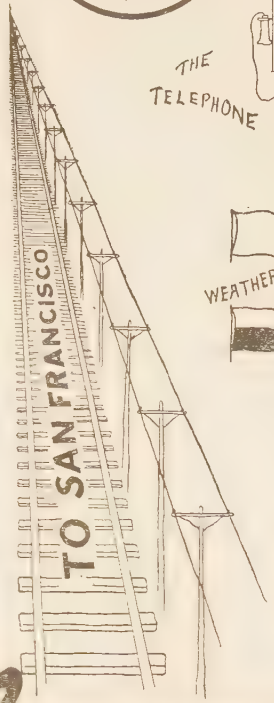


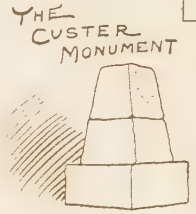


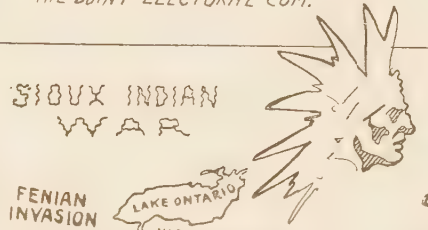
OTHER EVENTS

RATIFICATION OF THE FIFTEENTH AMENDMENT
THE FENIAN EXCITEMENT
THE GENEVA ARBITRATION
THE KU-KLUX INVESTIGATION
PANIC OF 1873
THE JOINT ELECTORAL COM.





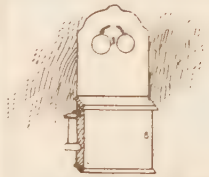




1877 "He serves his party best who serves his Country best" 1881

HAYES' ADMINISTRATION

"THE POLICY PRESIDENT"

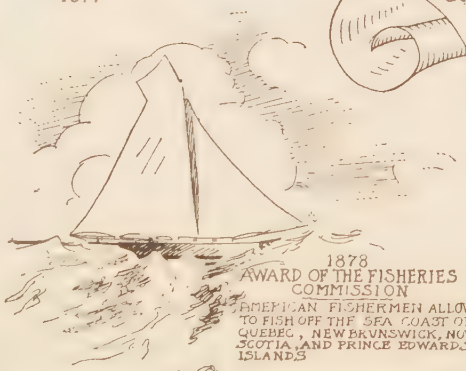


THE TELEPHONE GOES INTO GENERAL USE 1877

ELECTRIC LIGHTING ADOPTED 1877

SOME HAPPENINGS DURING "THE BUCKEYE PRESIDENTS" ADMINISTRATION

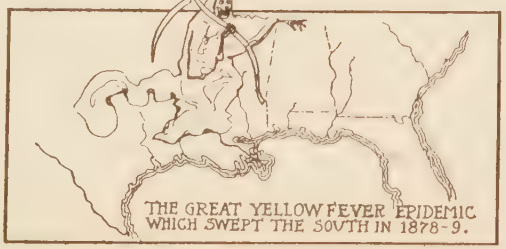
THE GREAT RAILROAD STRIKE 1877.
CIVIL SERVICE REFORM INTRODUCED.
TROUBLE WITH NEZ-PERCE INDIANS.
GREAT TEMPERANCE MOVEMENT-1878
DEATH OF Wm CULLEN BRYANT.
LIFE SAVING SERVICE ESTABLISHED 1879.
THE NEGRO EXODUS.
TENTH CENSUS-POP. 50,155,783.



1878 AWARD OF THE FISHERIES COMMISSION

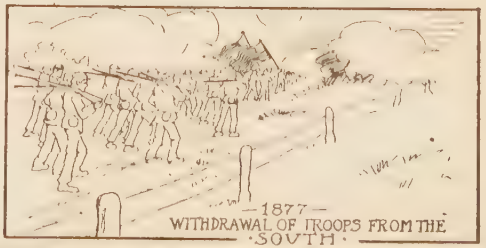
AMERICAN FISHERMEN ALLOWED TO FISH OFF THE SEA COAST OF QUEBEC, NEW BRUNSWICK, NOVA SCOTIA, AND PRINCE EDWARDS ISLANDS

SILVER MADE A LEGAL TENDER 1878



THE GREAT YELLOW FEVER EPIDEMIC WHICH SWEPT THE SOUTH IN 1878-9.

1879 GRANT MAKES A TOUR OF THE WORLD



1877 WITHDRAWAL OF TROOPS FROM THE SOUTH

"A POUND OF PLUCK IS WORTH A TON OF LUCK"

GARFIELD'S ·1881· ADMINISTRATION

"GOD REIGNS, AND THE GOVERNMENT AT WASHINGTON STILL LIVES"

YOUNG GARFIELD ON THE TOW-PATH

EVENTS OF ADMINISTRATION OF THE BRIEF "THE TEACHER PRESIDENT"

DIVISION OF REPUBLICAN PARTY OVER "DISPOSITION OF SPOILS"
PLATT AND CONKLING RESIGN FROM THE SENATE-
·ASSASSINATION OF THE PRESIDENT·
·STAR ROUTE INVESTIGATION·

$364,000 And President's Salary Donated to His Widow.

ASSASSINATION OF GARFIELD
JULY 2ND 1881

1881 Arthur's Administration 1885

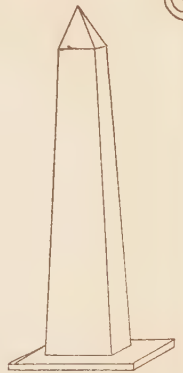
WASHINGTON'S STATUE NEW YORK

Hills.
ANTI-POLYGAMY
ANTI-CHINESE
CIVIL SERVICE

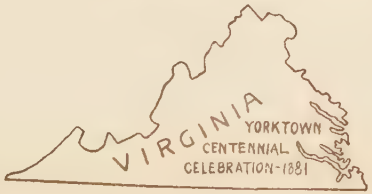
OTHER EVENTS

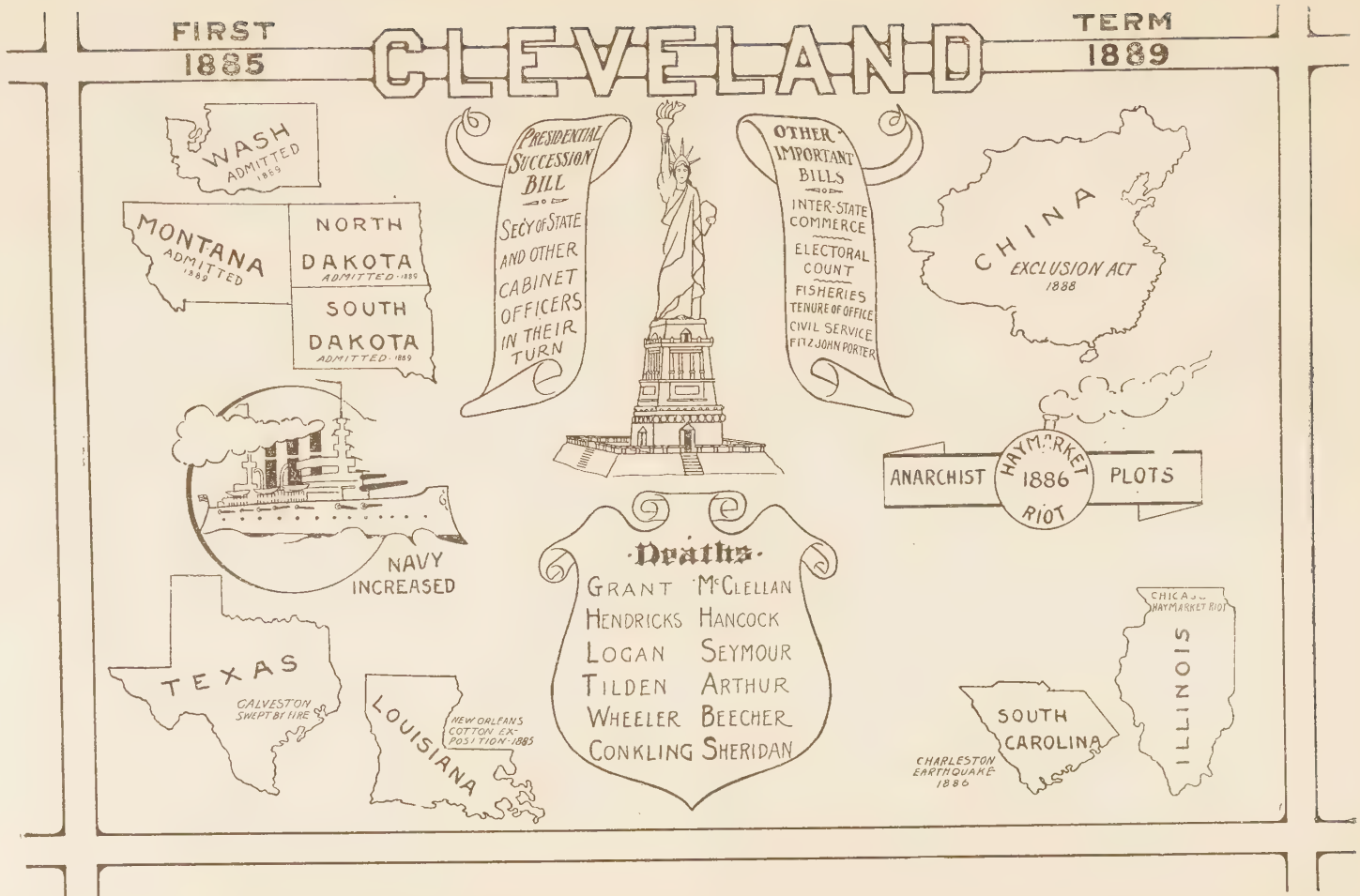
EXECUTION OF GUITEAU
NORTHERN PAC COMPLETED
POSTAL NOTES INTRODUCED
STANDARD TIME INTRODUCED
RED CROSS SOCIETY
ANTI-MONOPOLY & LABOR PARTIES

Death OF EMERSON AND LONGFELLOW



WASHINGTON'S MONUMENT




FIRST
1885
CLEVELAND
TERM
1889
WASH
ADMITTED
1889
MONTANA
ADMITTED
1889
NORTH
DAKOTA
ADMITTED-1889
SOUTH
DAKOTA
ADMITTED-1889
PRESIDENTIAL
SUCCESSION
BILL
SECY OF STATE
AND OTHER
CABINET
OFFICERS
IN THEIR
TURN
OTHER
IMPORTANT
BILLS
INTER-STATE
COMMERCE
ELECTORAL
COUNT
FISHERIES
TENURE OF OFFICE
CIVIL SERVICE
FITZ JOHN PORTER
CHINA
EXCLUSION ACT
1888
NAVY
INCREASED
ANARCHIST
HAYMARKET
1886
RIOT
PLOTS
Deaths
GRANT
McCLELLAN
HENDRICKS
HANCOCK
LOGAN
SEYMOUR
TILDEN
ARTHUR
WHEELER
BEECHER
CONKLING
SHERIDAN
TEXAS
GALVESTON
SWEPT BY FIRE
LOUISIANA
NEW ORLEANS
COTTON EX-
POSITION-1885
CHICAGO
HAYMARKET RIOT
ILLINOIS
SOUTH
CAROLINA
CHARLESTON
EARTHQUAKE
1886

HARRISON'S ADMINISTRATION

1889 — 1893

SOME OF THE MORE IMPORTANT EVENTS OF PRESIDENT HARRISON'S ADMINISTRATION.

-1889-

OKLAHOMA OPENED FOR SETTLEMENT.

THE PAN-AMERICAN CONGRESS.

THE JOHNSTOWN FLOOD

FOUR NEW WAR SHIPS BUILT

-1890-

THE FIRST EXECUTION BY ELECTRICITY.

THE 11TH CENSUS POP.-62,622,250-

IDAHO AND WYOMING ADMITTED AS STATES

THE SHERMAN SILVER PURCHASE ACT.

THE MORMONS CEASE TO TEACH AND PRACTICE POLYGAMY.

THE DEATH OF JOHN C. FREMONT

-1891-

CHICAGO AND LELAND STANFORD UNIVERSITIES FOUNDED.

THE BEHRING SEA TREATY.

OPENING OF DREXEL INSTITUTE IN PHILADELPHIA.

THE "BLACK HAND" IN NEW ORLEANS

TROUBLE WITH THE "MAFIA."

-1892-

THE HOMESTEAD LABOR TROUBLES

THE CHINESE EXCLUSION BILL RE-ENACTED.

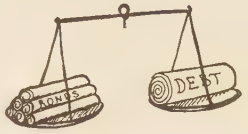
THE PANAMA SCANDAL.

THE UNITED STATES AID FAMINE STRICKEN RUSSIA.

THE FARMERS ALLIANCE MOVEMENT.

GROVER CLEVELAND'S SECOND ADMINISTRATION 1893 1897

ADMISSION OF UTAH TO THE UNION



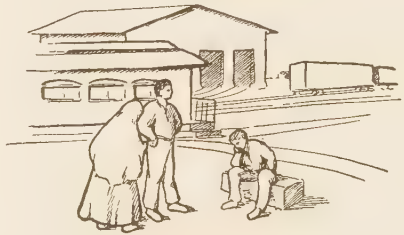
BOND ISSUE

CHINESE TREATY 1894

COLUMBIAN EXPOSITION

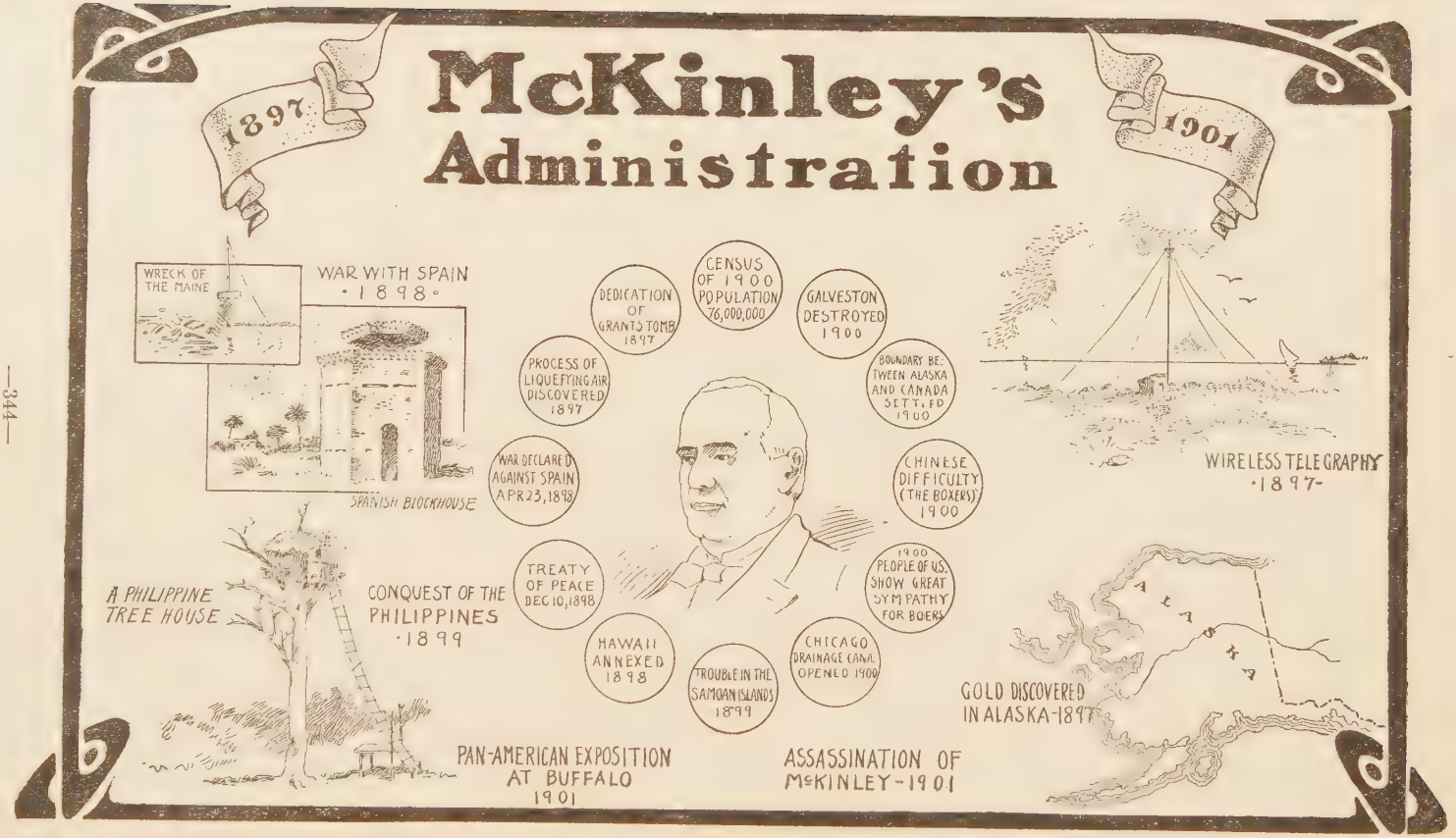
REBELLION IN CUBA

VENEZUELA CONTROVERSY



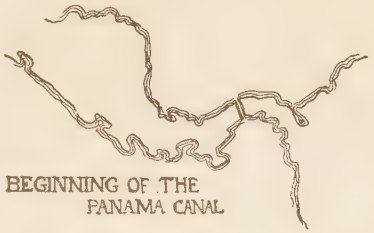
RAILWAY STRIKE

BERING SEA CONTROVERSY

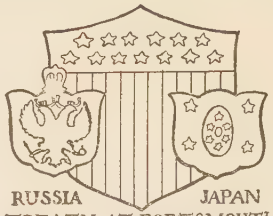

McKinley's Administration
1897
1901
WRECK OF THE MAINE
WAR WITH SPAIN
·1898·
SPANISH BLOCKHOUSE
A PHILIPPINE TREE HOUSE
CONQUEST OF THE PHILIPPINES
·1899
PAN-AMERICAN EXPOSITION AT BUFFALO
1901
ASSASSINATION OF McKINLEY-1901
GOLD DISCOVERED IN ALASKA-1897
ALASKA
WIRELESS TELEGRAPHY
·1897-
CENSUS OF 1900 POPULATION 76,000,000
GALVESTON DESTROYED 1900
BOUNDARY BETWEEN ALASKA AND CANADA SETTLED 1900
CHINESE DIFFICULTY (THE BOXERS) 1900
1900 PEOPLE OF U.S. SHOW GREAT SYMPATHY FOR BOERS
CHICAGO DRAINAGE CANAL OPENED 1900
TROUBLE IN THE SAMOAN ISLANDS 1899
HAWAII ANNEXED 1898
TREATY OF PEACE DEC 10, 1898
WAR DECLARED AGAINST SPAIN APR 23, 1898
PROCESS OF LIQUEFYING AIR DISCOVERED 1897
DEDICATION OF GRANT'S TOMB 1897

ROOSEVELT'S ADMINISTRATION

1901 1909



BEGINNING OF THE PANAMA CANAL



RUSSIA JAPAN TREATY AT PORTSMOUTH

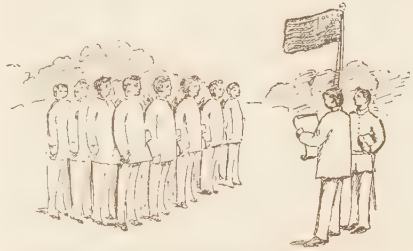
LEWIS AND CLARK EXPOSITION

CONSERVATION CONGRESS

ANTHRACITE COAL STRIKE

LOUISIANA PURCHASE EXPOSITION

JAMESTOWN EXPOSITION



COVERNMENT ESTABLISHED IN THE PHILIPPINES

PACIFIC CABLE LAID

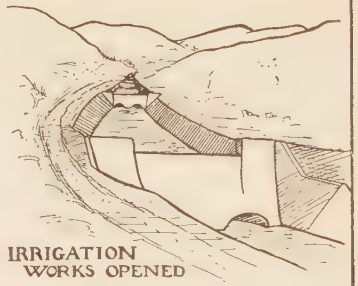
DEATH OF GROVER CLEVELAND

SAN FRANCISCO EARTHQUAKE, 1906

5

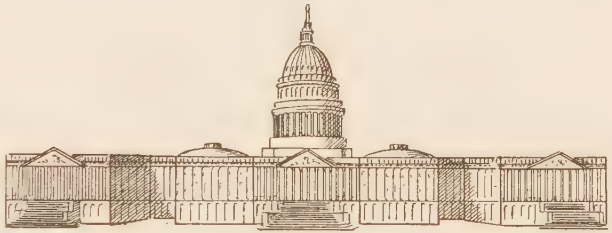
1909 TAFT'S 19– ADMINISTRATION

TARIFF REVISION



IRRIGATION WORKS OPENED

HUDSON-FULTON CELEBRATION



THE CAPITOL

JOURNEY THROUGH THE WEST

WATERWAY CONVENTION NEW ORLEANS

CORPORATION TAX

MEETING WITH DIAZ

TROUBLE IN NICARAGUA

CHAMPLAIN TER-CENTENNIAL CELEBRATION

Rulers of the World

Country	Ruler	Birth	Accession	Title
Abyssinia	Lidj Eyassu	1896	1908	King of Kings
Afghanistan	Habibullah Khan		1901	Ameer
Argentine Republic	Roque Saenz Pena		1910	President
Austria-Hungary	Francis Joseph I	1830	1848	Emperor
Belgium	Albert I	1875	1909	King
Bolivia	Senor Y. Montes		1904	President
Brazil	Hermes da Fonseca		1910	President
British Empire	George V	1865	1910	King
Bulgaria	Ferdinand	1861	1908	Czar.
Chile	Ramon Baros Luca		1910	President
China	Pu Yi		1909	Emperor
Colombia	Carlos E. Restrepo		1910	President
Costa Rica	Cleto Gonzales Viquez		1906	President
Denmark	Frederick VIII	1843	1906	King
Ecuador	Gen. Eloy Alfaro		1906	President
France	M. Armand Fallieres	1841	1906	President
German Empire	William II	1859	1888	Emperor
Greece	George I	1845	1863	King
Guatemala	Manuel E. Cabrera	1856	1898	President
Haiti	Gen. Simon		1908	President
Honduras	Miguel R. Davila		1907	President
Italy	Victor Emmanuel III	1869	1900	King
Japan	Mutsuhito	1852	1867	Mikado
Korea	Yi Chok	1874	1907	Emperor
Liberia	Arthur Barclay		1907	President
Luxembourg	Wilhelm		1908	Grand Duke
Mexico	Gen. Porfirio Diaz	1830	1876	President
Montenegro	Nicholas I	1841	1860	King
Morocco	Mulai Hafid	1873	1908	Sultan
Nepal	Dhiraj Shamsher Jang	1875	1881	Maharaja
Netherlands	Wilhelmina	1880	1890	Queen
Nicaragua	Dr. José Madriz		1909	President
Norway	Haakon VII	1872	1905	King
Oman	Seyyid Feysal Turki		1888	Sultan
Paraguay	Manuel Candra		1910	President
Persia	Ahmed Mirza	1897	1909	Shah
Peru	Augusto B. Leguia	1863	1908	President
Portugal	Theofile Braga		1910	President
Roumania	Carol I	1839	1881	King
Russia	Nicholas II	1868	1894	Czar
Salvador	Gen. Fern'do Figueroa		1907	President
Santo Domingo	Gen. Ramon Caceres		1906	President
Servia	Peter I	1844	1903	King
Spain	Alfonso XIII	1886	1902	King
Sweden	Gustavus V	1858	1907	King
Switzerland	Dr. A. Deucher		1909	President
Turkey	Mehmed V		1909	Sultan
United States	Wm. H. Taft	1857	1909	President
Venezuela	Gen. Gomez		1908	President

"Books are masters who instruct us without rods and ferules, without hard words and anger, without clothes or money."

Richard de Bury.

Language and Grammar

INTRODUCTION.

As the world judges a man's culture largely by the language that he uses, the study of this subject is obviously of the highest importance to every intelligent person. To aid the student in gaining a mastery of language, THE NEW PRACTICAL REFERENCE LIBRARY not only affords valuable information on such subjects as the development of language in general, and the characteristics of the languages of the different nations, as well as practical instruction in methods of teaching and studying language, but it presents ably composed articles upon a very wide variety of subjects, thus enabling the reader to extend his vocabulary and to acquaint himself with the proper meaning and application of a great number of new forms of expression. Among the articles to which special reference may be made are those on PHILOLOGY, LANGUAGE, ENGLISH LANGUAGE, FRENCH LANGUAGE, GERMAN LANGUAGE, etc.

For the benefit of teachers of the subject, a graded outline of work has been prepared. Following this work on language we give you an outline of the entire subject of grammar, which enables the student to study the subject systematically. This outline is adapted to any text-book which may be used in the schools, and should prove of marked benefit.

FIRST YEAR.

The correct forms of written and oral language work should be introduced and taught in all branches of school work and in the primary grades especially incorporated with the reading lessons.

A thorough understanding of and familiarity with the proper forms of speech used in conversation are the most important factors in the child's knowledge and use of language and for that reason pupils should be encouraged to talk. Subjects and objects of common interest may be introduced and the skillful teacher can, in these lessons, materially assist the child in briefly and clearly expressing himself and adding to his vocabulary by natural and gradual growth.

Description, by the pupils, of places where they have been and of things they have seen, stimulates imagination and observation and may prove highly entertaining.

Try, as far as possible, to teach the pupils to have some system in giving descriptions. Let them tell when they saw the object, where they saw it, how it looked and how it made them feel. By forming this habit a connected and comprehensive story can be told by the pupil without needless repetition and unnecessary words.

CONVERSATIONAL EXERCISES.

A conversational exercise in the form of a game may be effectively introduced, the teacher noting and correcting all faulty construction. One pupil may think of some object or thing and the pupils and teacher, by asking questions, try to guess the object in question. All questions and answers should be in complete sentences.

The interweaving of stories and games is a helpful, as well as attractive feature of this work and the following practical suggestions will prove of great assistance to the teacher in this important branch of her work:

Read or tell the class simple but interesting stories, told in words of the pupils' vocabulary, and after they have become familiar with the story allow one to commence it, another taking it up where the first one stops, and continuing until several pupils have taken part in the exercise.

Another attractive form of language work is to let certain pupils take the parts of the different characters in the story and in original sentences tell their part of the story. Such portions of the story as the child may not remember can be supplied by the teacher. In conducting these lessons any incorrect forms or sentences should be immediately corrected but in such a way that the pupil will not feel self-conscious.

MEMORY WORK.

The memorizing of simple poems comes under the head of language work and can be made interesting as well as instructive by the use of illustrations. Words or sentences which can be definitely associated with pictures or objects are much easier to remember and retain than miscellaneous words written upon the blackboard. Simple poems with which the class is familiar may be illustrated on the board by the pupils, each child being given one line to illustrate.

SENTENCE BUILDING.

Instructive lessons may be planned by drawing upon the board a picture of some animal, bird or race of people and short, simple sentences, explaining about the life and characteristics of the subject written in connection with it. For instance, if the subject is the Eskimo, a picture of an Eskimo child may be put upon the board with a hut or sled in the background and sentences such as "I live in the far North. My home is in a hut. I wear a fur coat. I eat fat food." Many other subjects can be treated in a similar manner. After the pupils become familiar with several, call some child to the board and let him write or say such sentences as "I wear warm clothes. I ride on a sled. A dog pulls me. I live in a hut," etc., the other pupils guessing the subject described.

SECOND YEAR.

As second grade language work is but a continuation of the first grade work, we mention only a few suggestions in addition to those already given for the first year.

Nature study should be brought into the language work and lessons on the various flowers, brought to school by the pupils, can be profitably introduced, describing and showing the various parts of the flower and their uses. When the children become familiar with the form, they can make pictures with pencil or colored crayon.

See how many sentences can be made describing the sweet pea, the pansy, the violet.

Pupils should now learn the use of singular and plural forms of verbs; the use of descriptive adjectives, of capitals, periods and interrogation marks. For this purpose sentences may be written on the board leaving blanks to be properly filled in by the child.

After reading a paragraph in their readers, have the pupils pick out words having "a" before them, also those having "an," and explain the difference. Put exercises on the board with the two articles left blank, to be filled in by the pupils.

Thanksgiving, Christmas, Decoration Day, and other holidays prove interesting topics for conversational lessons, and should be frequently introduced.

Pictures hung about the walls of a school room will appeal to the child's imagination, and interesting lessons can be made by calling on different pupils to describe and name objects found in the picture.

As an illustration of the way in which composition work can be presented by the teacher in this grade, at her suggestion, papers are handed in on which are written five or six sentences describing the appearance of an orange, or any other subject which has been under discussion. Careful attention is given to the arrangement, form and spelling of the words, and these papers with corrections are handed back for rewriting. This set of papers should be kept until the taste, uses, formation, etc., of the orange are discussed by the teacher and class and similar sentences written on each subject. These sentences, when corrected, can be condensed and incorporated in the form of compositions. The article and full page illustration on the orange, given in the NEW PRACTICAL REFERENCE LIBRARY, will be an invaluable aid in the preparation of this exercise.

THIRD YEAR.

Besides the oral and written exercises, composition work is taken up in this grade. This work should be based on the subjects discussed in oral lessons. Do not assign to beginners subjects which they do not understand. To write intelligently they must have a thorough understanding of the subject, gathered from observation, oral instruction and from reading.

The teacher may write on the board the outline of a story and the children fill it out in the form of written exercises.

A valuable exercise, in outlining subjects, is to have the pupils give the suggestions and the teacher arrange them in their proper order, after all have been given.

In taking up new subjects for study, it is not enough to give promiscuous information, but topical outlines, arranged in a systematic and concise manner, should be followed. For this purpose we give the following suggestive outline developed from the article in the NEW PRACTICAL REFERENCE LIBRARY to be used in connection with a lesson on Snow.

SNOW.

FORMATION.
- Frozen moisture.
- Crystallized moisture.
- Frozen vapor.

FLAKES.
- Six-pointed stars.
- Composed of crystals.
- Kinds.
  - Thin plates.
  - Prismatic with six sides.
  - Pyramids with six sides.
  - Spherical with needle shaped crystals.
  - Prismatic with thin plates at the ends.

SIZE.
- From one inch to 7/100 inch in diameter.
- Depending on temperature and moisture in atmosphere.
- Flakes larger when weather is mild.

Uses.
Non-conductor of heat.
Protects plants and seeds.
Supplies water for springs and rivers.
Fertilizes the ground.
Snowfall.
Heaviest in mountains.
Alps.
Rocky Mountains.
Snowline.
Lower in cool climate than in warm.
Varying according to altitude and latitude.
Glaciers.
Great masses of frozen snow.
Found in high altitudes and latitudes.

With such lessons for a basis, pupils, in composition work, will be able to group facts about the main topic in their logical sequence, and in doing so will learn the principles of paragraphing.

For drills on sentence making the teacher can give a sentence such as "The bird is singing," or "We heard its merry music," and let the class write as many sentences as they can think of which will convey the same meaning.

FOURTH YEAR.

As the pupils in this grade should be well advanced in sentence construction and possess a fair knowledge of the use of capitals, common abbreviations and punctuation, written exercises in the form of letters written to some friend, describing some place they have been or thing they have done, can be introduced, teaching the correct letter forms, how to fold letters and to address an envelope. These letters can be written to one another, one pupil being the postman and collecting and distributing the letters as directed. Each pupil in turn reads the letter he has received, omitting the name, and criticisms on the construction and proper language forms should be made by the teacher or by the class. The letter in question is corrected and at the end of the recitation all letters are handed to the teacher. By omitting the name of the pupil criticisms can be made freely without causing any child embarrassment.

Famous pictures should be introduced and hung about the room. Have pupils find out all they can about them and the artists who painted them. Call attention to the strong points in the picture; the objects which stand out in the picture.

A story should be read by the teacher, and when pupils are familiar with it, a test of the child's understanding of the story can be made by following the outline given below in reviewing it:

Author.
Name.
Home.
Life.
Principal characters.
Appearance.
Life.
Home.
Character.
Place in story.
Other characters.
What they did.
Appearance.
Part in story.
Incidents.
Principal happenings.
Causes.
Where they take place.

As the pupil advances in the grammar grades such outlines, made more exhaustive, will be an invaluable aid to the pupil in composition work.

How To Tell A Story To Children

JESSIE ELIZABETH BLACK

There is a popular fallacy that anybody can tell a story. Almost anyone will attempt to, and we are all familiar with many of the tedious, confused and pointless results. Why is it? Everyone, from the baby to the oldest one among us, asks to know life, to live deeply, if not in his very own emotions and experiences, then in those of others. Now the story is the answer to this general demand. To every age the story, in one form or another, makes its appeal; we all listen eagerly to a story.

Now a story consists of the gathering up of one set of emotional events from a possible million! What makes a tale tedious? Trying to mention as many of the million as possible, instead of keeping to the one set. What makes it confused? Trying to give the events without keeping in mind that they are in one set—that is, related definitely to each other. What makes a story pointless? Forgetting that, as the set of events is emotional, it must lead to some climax, some happening or point.

Once we get the idea of what a story really is, and hold to it, we are pretty likely to find that we, too, can tell a story well, after a little practice. Your "natural" story teller—the one who seems to have a veritable "gift" for telling stories to children, is keenly alive and constantly awake to what a story is, and because she is so, follows some such rules as these:

Know Your Story.

Know it so well that you feel free while you are telling it—certain just where each point is to come in, and sure of your climax. A few stories well learned is a better plan than many imperfectly known and thus poorly told.

Be Happy in It.

Your enjoyment and appreciation will convey themselves to the children. "Teacher makes us all laugh when she tells *The Hare and the Tortoise.* We wish she'd tell it every day."

See as You Tell.

Live over again the events of the narrative, as you talk. Children love action —want things to happen. Try to see the things happen, rather than to think overmuch about your words, and the story will unconsciously become vivid, dramatic and interesting.

Keep the Point in Mind.

Let the story shape itself, gradually, always with this one group of emotional events in mind. Don't drag in anything, however interesting, that is not closely connected with the business of the story. Let all you say illuminate your text in some way.

Telling "The Three Goats."

The following story was told just as it is given here, by a teacher familiar with the principles of good story telling. Notice her (1) familiarity with it, (2) her own evident enjoyment of it, (3) its vividness and action, and (4) how all that is told helps on the movement of the tale. There is no attempt at moralizing, and yet how plainly the results of the various actions come out!

The Three Goats.

Once upon a time there were three goats who were going to the green pasture

across the river to eat, and eat, and eat, so that they would become very fat. They all three happened to be named "Gruff."

Now a great ugly troll lived under the bridge they had to cross to reach the green pasture. Ah, but he was a monster; his eyes were as big as plates and his wiggly nose as long as a hoe-handle!

The youngest goat Gruff stepped upon the bridge first.

"Trip trap! Trip trap!" whispered the bridge.

"Who is tripping over my bridge?" called the dreadful troll.

"Oh! it is only I, the very smallest of the goats Gruff."

"I'm coming to eat you up!" roared the troll.

"Please, please don't! I wouldn't make a mouthful for you. Wait till the second goat Gruff comes. He is much larger than I am."

"Trip on, then. I want a bigger mouthful," growled the troll.

Soon the second goat Gruff came along.

"Trip trap! Trip trap!" said the bridge.

"Who is tripping over my bridge?" called the dreadful troll.

"It is I, the second goat Gruff," said the goat in a voice like yours or mine.

"I'm coming to eat you up!" roared the troll.

"Please don't! I'm not very big. Wait till the third goat Gruff comes. He is much larger than I. He'd be well worth eating."

"Trip on, then. I want a very large meal," replied the ugly troll.

Very soon the big goat Gruff came.

"Trip trap!! Trip trap!! called the bridge. It was ready to break with the weight.

"Who is stamping over my bridge?" called the dreadful troll.

"IT IS I, THE GREAT GOAT GRUFF!" called the largest goat in a voice as loud as the troll's.

"I'm coming to eat you up!" roared the troll.

"HO! COME ON, THEN, COME!" roared the great goat Gruff.

And the troll came. The great goat Gruff butted him with his great horns and threw him into the river in a hundred pieces. He never ate up any one again who tried to cross the bridge.

Then the three goats Gruff ate, and ate, and ate, in the green pasture. Unless they have stopped, they are eating there still.

Essays

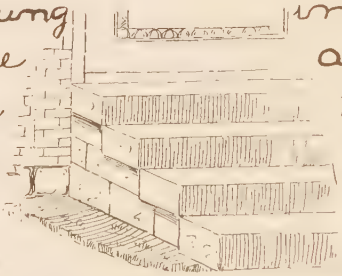
The interesting series of essays which follow show how the suggestions and directions under *Language Work* can be carried out in a practical way by using subjects that are so common that children as well as adults are familiar with them. This practical application of these principles shows the assistance which The New Practical Reference Library renders to teachers and parents in their efforts to develop new work.

In assigning these exercises the teacher should call the attention of the pupils to the subject the day before it is to be discussed in the class, and ask them to find out for themselves all that they can about it. Only one subject should be assigned at a time, and another should not be given until the work of the first is completed. This may require more than two lessons. If the pupils are allowed to work on two subjects at a time, they become confused and sometimes discouraged. The pen sketches show what pupils can do easily with pen or pencil. Those here given can be reproduced by almost any child who has good control of the pen.

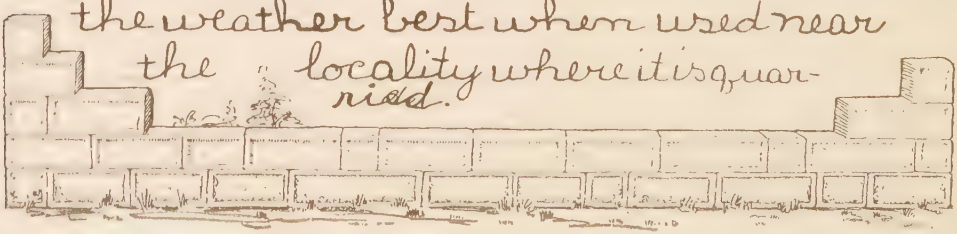
STONE

~BY CHARLIE SMITH~

Stones are of extensive use for a great variety of purposes, such as building, paving, grinding and ornamental purposes. Granite, slate, limestone, marble and sandstones are the building stones in most common use in the United States. There are numerous other stones however suitable for finishing interiors such as serpentine and onyx.



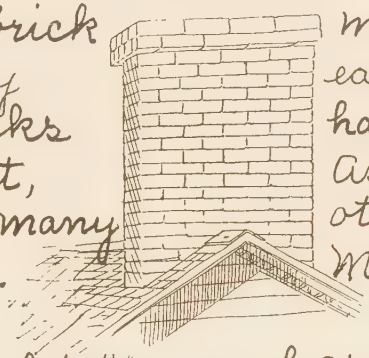
Granite is the strongest and slate the most durable of building stones. Soft sandstones absorb a great deal of water and are not durable for exteriors. Stones containing iron or other substance which the water dissolves frequently becomes discolored. Stone generally withstands the weather best when used near the locality where it is quarried.

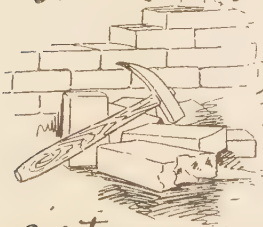


By HARRY SCOTT.

Brick is a sort of artificial stone made by molding a mixture of clay and sand and drying it in the sun or baking or burning in a kiln. The ordinary brick used in building and paving is eight inches long, four inches wide, and two inches thick.

The art of brick making dates from very early times. Sun dried bricks have been found in Egypt, Babylonia, Assyria, and many other ancient countries. Many of these bricks contain inscriptions which are of great historic value, since they constitute the only known record of the people and events of the time in which they were made.





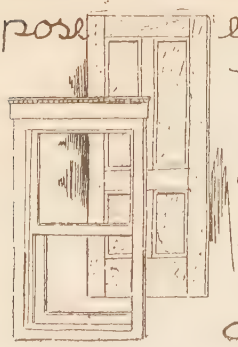
Bricks are extensively used in the foundations and walls of buildings. They are also used for sewers, cisterns, and numerous other purposes.

BY MILLIE DEBALL

Lumber is timber manufactured for building purposes. Its manufacture constitutes one of the most important as well as one of the most extensive industries of the world.

The forests in the United States are being rapidly destroyed and unless something is done to preserve them in a very short time there will be no lumber left in our country. In most foreign countries as soon as a tree is cut down it is replaced by another.

There are many and various uses of lumber. The greater per cent of lumber is used for building purposes, but there is a great deal made into furniture.

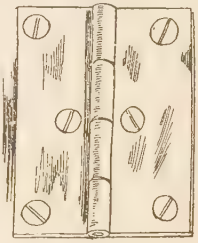


The most common kinds of lumber in this country are maple, pine, oak, elm, poplar, walnut, butternut and ash.

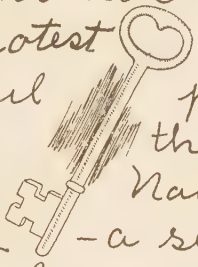
IRON

BY GEORGE CAMPBELL

Iron ore is very liberally distributed over the earth and with the exception of Australia every continent has a good supply. The United States is the largest producer of iron ore.



It is the most useful of all metals and has been known from the remotest times. One of the most useful products of iron entering into the making of a home is nails. Nails are made automatically - a single machine making five hundred nails per minute. Their manufacture forms a very interesting study.

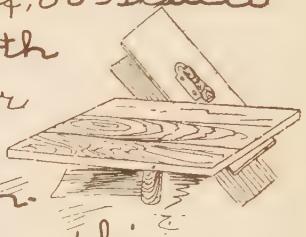


Brackets supporting balconies, windows or upper portions of a building are generally made of iron and sometimes elaborately designed and ornamented. Many other items of use and ornament are supplied our homes by this most useful metal.

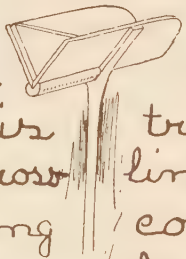
PLASTER

BY MAY GRANT.

Plastering is the art of covering the surface of masonry or woodwork with mortar, cement, staff, or stucco in order to give it a smooth and uniform surface. For the purpose of receiving the plaster the wall is generally covered with laths, or thin strips of wood or steel with narrow spaces between them.

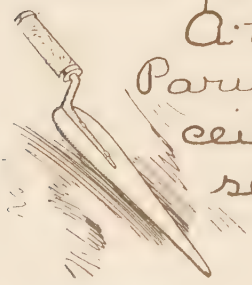


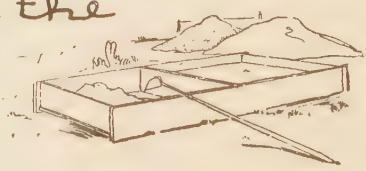
The face of the first coat which should be of considerable thickness is trowelled or indented with cross lines to form a key for the finishing coats. The second coat is applied when the first is thoroughly dried.



The setting coat which is of pure lime or, for fine work, of plaster of Paris or stucco, is applied to the second coat before it is quite dry.

A thin coating of plaster of Paris is frequently applied to ceilings after the setting coat.





GLASS

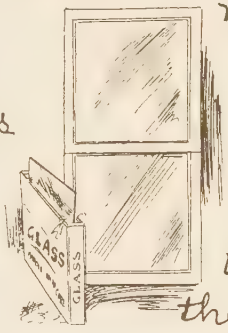
By GLADYS HAYES

Glass, a hard brittle substance, is made by melting by intense heat certain ingredients.

Unless colored by some foreign substance it is usually transparent.

There are many different kinds of glass, some varieties are flint, crown, window, bottle, and plate.

The principal methods of manufacture are those used for window glass, bottle glass, and plate glass.



For window glass the material is blown into the form of a cylinder, it is then slit, flattened, and cut into the desired sizes.

For bottle glass the sticky, melted glass is taken on the end of a tube and put into a mould where it is blown into shape.

For plate glass the melted compound is poured out on a large iron table, rolled to the desired thickness, cooled and afterwards polished.

By Irma Jones

Paint is a compound of coloring substances mixed with oil glue or water. The coloring substance is called a pigment and the liquid with which it is mixed a vehicle. The greater number of pigments are mineral but some like cochineal are animal substances and others, like indigo, are of vegetable origin.

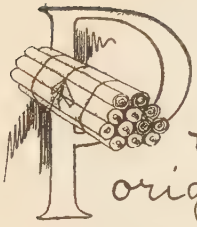
For ordinary house paint especially for external uses, white lead and boiled linseed oil are generally used.

Varnish is a liquid made by dissolving a resin in alcohol, turpentine or other oil. It is used to form a thin, transparent coat over surfaces, to protect them from heat, air and moisture and to make them more beautiful

The base of varnish is Copal, or fossil gum. The best gum is found in Zanzibar.

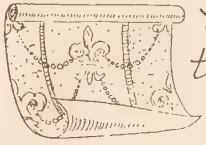
Wall Paper.

BY JOHN HUDSON



Paper used for decorating the walls and ceilings of rooms originated among the Chinese and was not introduced into Europe until the eighteenth century.

The papers at first were imitations of the leather tapestry and velvet hangings which had long been common as wall decorations but gradually the designs became original and varied.



Most of the processes are by machinery similar to that used in calico printing, but there is also much hand work done in the finer qualities.

The paper is prepared in strips which are made fast to the wall by paste.

The skill of the workman consists in matching the strips and laying the paper so as to avoid wrinkles.

The manufacture of wall paper is a great industry and paper hanging is an important occupation.

Outlines for Grammar Work

- **SENTENCES.**
  - Classes.
    - Declarative.
    - Interrogative.
    - Imperative.
    - Exclamatory.
  - Parts.
    - Subject.
    - Predicate.
    - Modifiers.
  - Kinds.
    - Simple.
    - Complex.
    - Compound.
  - Arrangement.
    - Normal.
    - Inverted.

- **CLAUSES.**
  - Classes.
    - Principal.
    - Dependent.
  - Uses.
    - Substantive.
    - Adjective.
    - Adverbial.
    - Independent.
  - Forms.
    - Simple.
    - Complex.
    - Compound.

- **PHRASES.**
  - Uses.
    - Adjective.
    - Adverbial.
    - Substantive.
    - Independent.
  - Classes.
    - Prepositional.
    - Infinitive.
    - Participial.
    - Independent.
  - Forms.
    - Simple.
    - Complex.
    - Compound.
  - How determined.
    - Use.
    - Structure.

- NOUN.
  - Classes.
    - Proper.
    - Common.
      - Concrete
      - Abstract.
      - Verbal.
      - Collective.
  - Properties.
    - Person.
      - First.
      - Second.
      - Third.
    - Number.
      - Singular.
      - Plural.
    - Gender.
      - Masculine.
      - Feminine.
      - Common.
      - Neuter.
    - Case.
      - Nominative.
      - Possessive.
      - Objective.

- PRONOUN.
  - Classes.
    - Personal.
      - Simple.
      - Compound.
    - Relative.
      - Simple.
      - Compound.
    - Indefinite.
      - Distributive.
      - Compound.
      - Comparative.
      - Indicating number or quantity.
    - Interrogative.
    - Demonstrative.
  - Properties.
    - Person.
    - Number.
    - Gender.
    - Case.

    The same as for nouns.

- VERB.
  - Classes.
    - Regular.
    - Irregular.
    - Notional.
    - Auxiliary.
  - Use.
    - Transitive.
    - Intransitive.
  - Properties.
    - Voice.
    - Mode.
    - Tense.
    - Person.
    - Number.
  - Principal parts.
    - Present.
    - Past.
    - Past Participle.
  - Conjugation.

- ADVERB.
  - Forms.
    - Simple.
    - Compound.
  - Classes.
    - Limiting.
      - Time.
      - Place.
      - Manner.
      - Degree.
      - Cause.
    - Interrogative.
    - Conjunctive.
  - Comparison.
    - Positive.
    - Comparative.
    - Superlative.

- ADJECTIVE.
  - Forms.
    - Simple.
    - Derivative.
    - Compound.
  - Use.
    - Predicate.
    - Modifying.
  - Classes.
    - Descriptive.
    - Limiting.
    - Articles.
      - Definite.
      - Indefinite.
    - Pronomials.
      - Demonstrative.
      - Interrogative.
      - Indefinite.
  - Comparison.
    - Degree.
      - Positive.
      - Comparative.
      - Superlative.
    - Method.
      - Inflection.
      - Composition.
      - Irregularly.

- PREPOSITION.
  - Forms.
    - Simple
    - Compound.
  - Use.
    - Expresses relation.
    - Introduces phrases.

- CONJUNCTION.
  - Form.
    - Simple.
    - Correlative.
    - Phrasal.
  - Classes.
    - Coördinate.
      - Copulative.
      - Alternative.
      - Adversative.
      - Relative.
    - Subordinate.
      - Mere connectives.
      - Conjunctive adverbs.
      - Relative pronouns.
  - Use.
    - Connects words.
    - " phrases.
    - " clauses.

Orthography

The branch of language-study that deals with the representation of spoken sounds by letters, and with the combination of letters in words, according to established rules for spelling, is known as orthography. The thorough development of this subject is the work of the scholar, but a mastery of its rudiments is plainly necessary to everyone who wishes to speak and write correctly the words used in everyday life. Unless one knows how the various letters in the written alphabet stand for the sounds in the spoken language, and is acquainted with the general rules for combining letters in the formation of words, he will always be liable to embarrassing errors in pronunciation and spelling and must be decidedly at a disadvantage in both his social and his business life. To meet the needs of the general reader who wishes to make an elementary study of orthography, the essentials of the subject are set forth in the following paragraphs.

SOUNDS AND SYMBOLS.

Diacritical Marks. In the English language there are many more spoken sounds than there are letters to represent these sounds. Consequently, a single letter must sometimes serve, by means of modifications, to indicate more than one sound. As a convenient means for denoting a difference in the sound of a letter by a change in the appearance of the letter on the written page, symbols known as diacritical marks are used. The forms of these symbols, their names, and illustrations of their use appear in the following table.

Marks.	Names.	Symbols.	Marks.	Names.	Symbols
¯	Macron	ā	~	Tilde	ẽ
˘	Breve	ă	‾	Lower Bar	u̲
^	Circumflex	â	‗	Suspended Bar	s̲
¨	Dots above	ä	⁼	Transverse Bar	e⁼
¨	Dots below	a̤	¸	Cedilla	ç
˙	Dot above	ȧ	⊥	Modified Macron	ā
.	Dot below	ạ	ˇ	Inverted Breve	a̯

Classification of Sounds. According to the kinds of sounds that they represent, the letters of the language are divided into two classes, known as vowels and consonants. Vowels are open sounds made by an unobstructed passage of the breath through the vocal organs. The letters that indicate these sounds are *a, e, i, o, u* and sometimes *w* and *y*. Consonants are sounds formed by a stoppage of the breath in the mouth or the throat.

Sounds are said to be *vocal* when they have a tone or voice quality, and *aspirate* when they are merely breath sounds. The vowels are pure vocal sounds since they have tone qualities that are expressed without any obstruction. In the case of several of the consonants, however, the tone quality is suppressed or obstructed by the organs of speech, and the sounds are therefore known as subvocals. When two vocal sounds are combined, as in *oi* in *voice*, the resulting sound is known as a diphthong.

In the following tables the sounds in the language are classified into the three kinds that have just been defined, and an equivalence between sounds has been carefully set forth. Though the lists may not be committed to memory, they will undoubtedly prove valuable for reference.

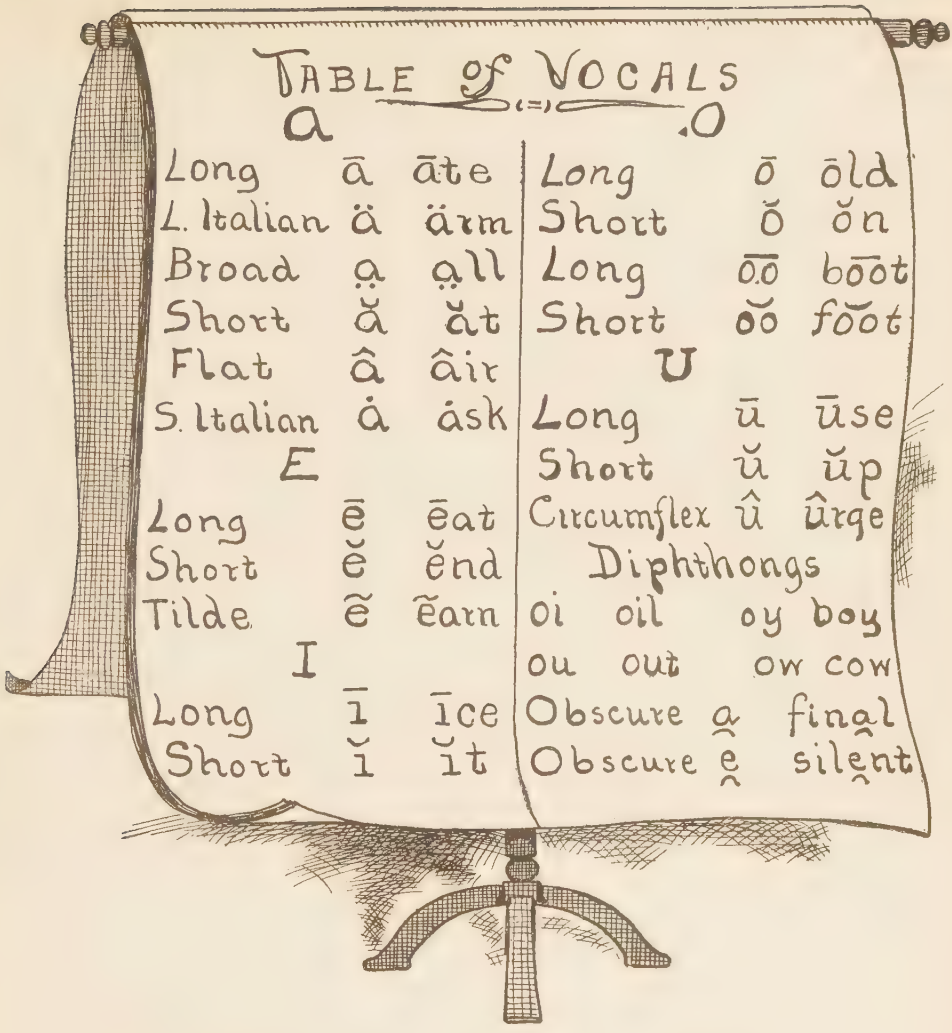


TABLE OF VOCAL EQUIVALENTS.

ạ	as in whạt	ŏ	
ã	as in liãr	ẽ	
ê	as in thêre	â	
ę	as in they	ā	
ı̈	as in polıïce	ē	
ī	as in fīrm	ē	
ô	as in ôught	ạ	
ȯ	as in sȯme	ŭ	
õ	as in tailõr	ẽ	
o͝	as in to͝	o͞o	
o͝	as in wo͝rld	o͝o	
u͝	as in mu͝le	o͞o	
u͝	as in fu͝r	o͝o	
ȳ	as in crȳ	ı̆	
y̆	as in badly̆	ı̆	
ỹ	as in mỹrtle	ẽ	

TABLE OF SUB VOCALS.

b	as in band
d	as in dead
g	as in gun
j	as in joy
l	as in lip
m	as in men
n	as in none
ng	as in sung
r	as in tar
th	as in then
v	as in vain
w	as in went
y	as in yacht
z	as in zinc
s	as in treasure
si	as in version

Table of Aspirates.	
f	as in far
h	as in hand
k	as in kind
p	as in pen
s	as in sin
t	as in tip
th	as in through
sh	as in shore
ch	as in chick
wh	as in whirl

Subvocals and Aspirate Equivalents.		
ç	as in miçe	s
ȼ	as in ȼatch	k
çh	as in porçh	sh
ġ	as in ġin	j
n̲	as in pin̲k	ng
ñ	as in oñion	ny
s̲	as in phas̲e	z
x	as in box	ks
x̲	as in ex̲it	gz
ph	as in sylph	f
qu	as in quick	kw
q*u*	as in croq*u*et	k

SYLLABICATION AND ACCENT.

Consonant and vowel sounds are combined in groups known as syllables, and these groups are in turn united to form words. Sometimes a single vowel may form a syllable, but a consonant cannot be thus used alone; it must always be combined with a vowel. The syllables of which a word is formed must be carefully noted, for in pronunciation one of the syllables of the word is distinguished by special emphasis or accent, and the others must be clearly enunciated; and in writing it frequently happens that the parts of a word must be separated at the close of a line, thus requiring a proper division into syllables. A general rule for the division of a word into syllables is that if two consonants occur between two vowels, one goes with each vowel, and that when but one consonant comes between two vowels the consonant usually goes with the second vowel. When a word consists of but one syllable, pronunciation depends wholly upon correct utterance of the sounds of which the word is composed; but when there are two or more syllables, proper placing of the accent becomes one of the essentials of pronunciation.

SPELLING.

Learning to Spell. Quite as important as correct articulation of the sounds that form a word and the proper placing of the accent, is accurate spelling of the word. The ability to spell correctly is cultivated largely by means of careful observation in one's reading and by persistent efforts to be exact in spelling words both orally and in writing. Especially is this true of those who use English, since our language is usually lacking in uniformity in the matter of spelling. However, there are several rules for spelling that are so generally applicable as to be of much value to those who do not readily retain in memory the exact form of words. Among these rules the following may be stated as the most important:

RULES OF SPELLING.

Words ending in *ie* usually drop the *e* and change *i* to *y* in adding the suffix *ing;* is, lie, lying.

Words ending in *y*, preceded by a consonant, change *y* to *i* when a suffix beginning with *i* is added; as, bounty, bountiful.

Words ending in *y*, preceded by a vowel, retain the *y* in adding a suffix; as, joy, joyous.

Monosyllables and words accented on the last syllable, ending in a single consonant, preceded by a single vowel, double the final consonant before a suffix beginning with a vowel; as, hit, hitting; begin, beginning.

Words ending in silent *e* drop this final *e* when a suffix beginning with a vowel is added; as, residue, residuum.

Words ending in *e* usually retain this final letter when adding a suffix beginning with a consonant; as, resolute, resoluteness.

When a syllable is added to a word ending in a double consonant, this consonant is usually retained; as, still, stillness.

Singuler nouns regularly form their plurals by adding *s*; as, table, tables.

However, when the singular noun ends with a sound that does not unite with *s, es* is added; as, church, churches.

Nouns ending in *y* preceded by a vowel form their plurals by adding *s;* as, monkey, monkeys.

When final *y* is preceded by a consonant, *y* is changed to *i* and *es* is added in forming the plural; as, city, cities.

Some nouns ending in *f* or *fe* change the *f* or *fe* to *v* and add *es* to form the plural; as, shelf, shelves.

Singular nouns ending in *o,* preceded by a consonant, sometimes form the plural by adding *s* but more frequently by adding *es;* as, solo, solos; motto, mottoes; potato, potatoes.

Methods for Teaching. Cultivation of accuracy in spelling should begin in early childhood. Mothers and teachers should make use of every opportunity to impress the correct forms of words upon children's minds. This is done by placing before the children the mental picture of the words as they appear in their written form and by teaching the sounds of the words, exactly pronounced. Irksome drills in spelling are to be avoided. Interest may be introduced into the work by associating it with that done in other lines of study, as in reading, language and nature study. All new words met with in these subjects should be carefully noted and the correct spelling and pronunciation should be learned and associated with the meaning. Word games may be used with good effect, as for example, that in which as many words as possible are formed from the letters of a given word. Spelling matches, too, though not a new form of diversion, prove interesting and helpful. In oral spelling the words given should be pronounced but once, and the one who is spelling should be allowed to try but once.

In both oral and written spelling correction of errors should be made promptly and carefully. The right forms of words must be constantly kept before children; hence the practice of giving classes lists of misspelled words for correction and of requiring pupils to keep lists of their errors is most undesirable.

Root Words and Derivatives. Interesting recitations in the formation of derivatives from root-words may prove of much assistance in teaching children to analyze the building up of words when they find difficulty in spelling them. A root word may be chosen and as many derivatives as possible formed from it by adding prefixes and suffixes. The same lesson may prove doubly profitable by defining the root word and showing the changes in significance after the addition of the prefixes or suffixes. The following is offered as a suggestive exercise:

TRACT—DRAW.

Tract-or ..... or = that which.
Tract-ion ..... ion = act of.
Tract-ile ..... ile = may be.
Tract-able ..... able = able to be.
Abs-tract ..... abs = away from.
At-tract ..... at = near to.
Con-tract ..... con = together.
De-tract ..... de = away from.
Ex-tract ..... ex = out of.

Pro-tract ..... pro = out.
Re-tract ..... re = back.
Sub-tract ..... sub = from under.
Attract-ive ..... ive = tending to.
In-tract-able ..... in = not....able = able to be

A tractor is an instrument which draws.

Traction is the state of being drawn or the act of drawing, as the traction of a muscle.

Gold is a tractile metal, as it may be drawn out in thin strips.

A tractable person is one easily drawn to a proper course of conduct.

An abstract manner results when the mind is drawn away from surrounding objects.

To attract people we must have power to draw them to us.

To detract from value is to lessen or draw away from it.

An extract from a book is a part which is drawn out of it.

A protracted meeting is one which is drawn out or extended beyond the usual time.

When the claws of a cat are retracted they are drawn back.

When a number is drawn from under or taken away from another we subtract it.

That which tends to draw one to it is attractive.

An intractable student is one who is not easily drawn to discipline.

The Dictionary. The use of the dictionary should be early encouraged, and it can be made attractive by introducing it into word-games and by telling in a simple and entertaining way of the history or derivation of some of our most interesting words. Thus begun, the highly desirable practice of consulting the dictionary in cases of doubt, regarding either spelling or pronunciation, may become so established that it will remain a life-time habit.

He teaches best who enables his pupils to dispense with his aid as he governs best who makes his rule unnecessary.

—*Bishop Spalding.*

Literature

Literature is ever young, ever helpful, ever inspiring. So varied are its departments, so wide its scope, so universal its application that no one can escape its benign influence if once he comes heartily in contact with it. Whatever in printed matter brightens, vivifies, uplifts and encourages, that is true literature. Sometimes the spirit emanates from a phrase, a sentence, a paragraph. Again it is a lyric, a drama or a beautiful story that catches the attention, stirs the feelings and molds the character. Whichever it be, it is true literature if it seizes the soul.

Prose and Poetry are the two great divisions of literature, differing widely in their form, but much alike in their essence. To some minds one form makes a stronger appeal than the other, but both will charm the open-minded. While prose may have more intellectual uplift, poetry appeals more strongly to the sense of beauty, beauty in form, in sentiment, in music.

Orations, Essays, Novels, Stories, Fables, such are varied kinds of prose that literature offers; and in poetry there are Epics and Lyrics, with the subordinate classes, Ballads, Odes, Elegies and Sonnets. What a range that is, and how varied its nature! For the gay hours there are lively stories by Kipling, rollicking lyrics by Holmes; for times of doubt the inspiring songs of Longfellow and the courageous essays of Emerson; for times of grief the heartfelt lines of Lowell, the encouraging couplets of Tennyson. No phase of mind is so peculiar that its nature is not known to the great-hearted men who have written for us.

To the young literature is as interesting as a new toy whose working they would know; to the middle-aged, a recreation and an inspiration; to the old, a comfort and a solace. Strangely enough, the same selection may affect thus differently at the same time people of all ages.

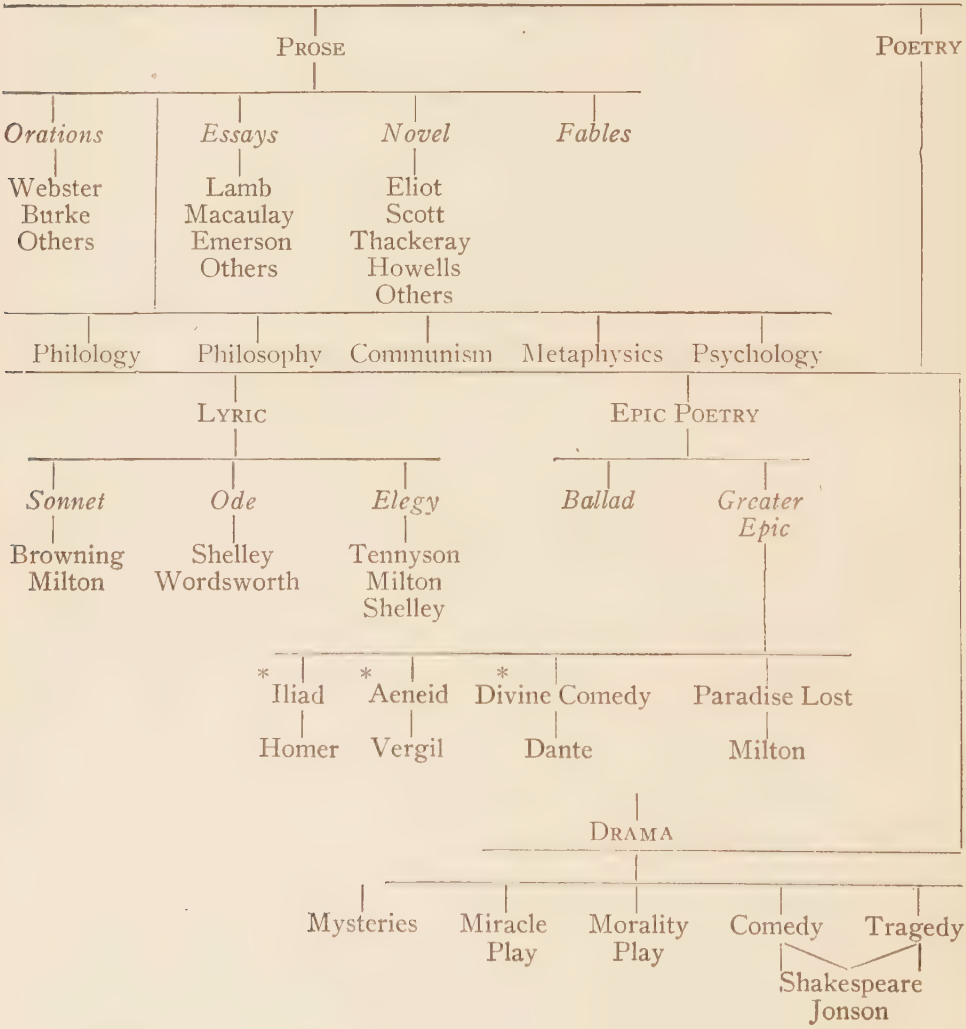
If in the family circle or at school there has been created a desire to read, the desire should be satisfied and the desire converted into a distinct good taste in selection. This may be done if proper books are placed in the hands of the learner. Here is seen the immense value of such an article as that on READING in THE NEW PRACTICAL REFERENCE LIBRARY. To this the parent or teacher can go to find directions for reading and to get lists of books adapted to children or to adults. There too will be found references to articles in the REFERENCE LIBRARY which will carry the reader far into those generous fields of literature which have in them food for every mind.

There will be found hundreds of interesting biographies of well-known writers of every nation throughout the work, giving a list of their writings and in many instances the circumstances under which they were written.

The accompanying outline touches only the literature of England and the United States. It is thought that the cross references in the other sections of the article LITERATURE are self-explanatory.

The outline on *English and American Literature* has been put in graphic form, but has not been carried out to its utmost. For instance, in the discussion of *Poetry*, many more sonneteers, writers of odes and elegists are to be found than are mentioned in the table. The same is true, of course, under *Drama*, but you will note that there are but four great epics of world-wide importance; those are named and the author of each is given.

English and American Literature



*Translations.

English Literature

(1500 TO PRESENT TIME.)

I. ELIZABETHAN AGE.
  1. Poets and their Principal Works.
    a. Non-Dramatic.
      Edmund Spenser. 1552-1599.
        Shepheardes Calendar.
        Faery Queen.
    b. Dramatic.
      William Shakespeare. 1564-1616.
        The Merchant of Venice.
        Hamlet.
        Macbeth.
      Ben Jonson. 1573-1637.
        Every Man in His Humor.
      Christopher Marlowe. 1564-1593.
        Tamburlaine.
  2. Prose Writers and Their Principal Works.
    a. Historical.
      Sir Walter Raleigh. 1552-1618.
        History of the World.
    b. Theological.
      Richard Hooker. 1553-1600.
        The Ecclesiastical Polity.
    c. Philosophical.
      Francis Bacon.
        Novum Organum (New Instrument).
        Essays.

II. THE AGE OF MILTON.
  1. Poets and Their Principal Works.
    a. John Milton. 1608-1674.
      Paradise Lost.
      L'Allegro.
      Il Penseroso.
    b. Abraham Cowley. 1618-1667.
      Davideis.
  2. Prose Writers and Their Principal Works.
    a. Izaak Walton. 1593-1683.
      The Compleat Angler.
    b. Jeremy Taylor. 1613-1667.
      Holy Living and Holy Dying.
    c. Dr. Richard Baxter. 1615-1691.
      The Saints' Everlasting Rest.
      Call to the Unconverted.
    d. John Milton.
      Areopagitica.
      Tenure of Kings and Magistrates.

III. THE AGE OF RESTORATION.
  1. Poets and Their Principal Works.
    a. John Dryden. 1631-1700.
      Alexander's Feast.
      Religio Laici.
      Hind and Panther.

2. Prose Writers and Their Principal Works.
   a. John Bunyan. 1628-1688.
      Pilgrim's Progress.
      Life and Death of Mr. Badman.
   b. John Locke. 1632-1704.
      Essay Concerning Human Understanding.
   c. Sir Isaac Newton. 1642-1727.
      The Principia.
      Optics.

IV. Augustan Age.
   1. Poets and Their Principal Works.
      a. Alexander Pope. 1688-1744.
         Essay on Man.
         Iliad.
         Dunciad.
      b. Edward Younge. 1681-1765.
         Night Thoughts.
         Revenge.
   2. Prose Writers and Their Principal Works.
      a. Joseph Addison. 1672-1719.
         Sir Roger de Coverly Papers.
         Essays.
      b. Richard Steele. 1672-1729.
         Essays.
      c. Jonathan Swift. 1667-1745.
         Gulliver's Travels.
         Journal to Stella.
      d. Daniel Defoe. 1661-1731.
         Robinson Crusoe.
         Journal of the Plague Year.

V. The Age of Johnson.
   1. Poets and Their Principal Works.
      a. Thomas Gray. 1716-1771.
         Elegy Written in a Country Churchyard.
         The Bard.
      b. Oliver Goldsmith. 1728-1774.
         The Vicar of Wakefield.
         The Traveler.
         She Stoops to Conquer.
         The Deserted Village.
      c. William Cowper. 1731-1800.
         The Task.
         The Diverting History of John Gilpin.
      d. Robert Burns. 1759-1796.
         Cotter's Saturday Night.
         Tam O'Shanter.
   2. Prose Writers and Their Principal Works.
      a. Samuel Richardson. 1689-1761.
         Pamela.
      b. Henry Fielding. 1707-1754.
         Tom Jones.

c. Samuel Johnson. 1709-1784.
Rasselas.
d. David Hume. 1711-1776.
History of England.
Essays.
e. Edward Gibbon. 1737-1794.
Decline and Fall of the Roman Empire.
f. Edmund Burke. 1729-1797.
On Conciliation with America.

VI. Age of Scott.
1. Poets and Their Principal Works.
a. Walter Scott. 1771-1832.
The Lady of the Lake.
Marmion.
Lay of the Last Minstrel.
b. George Gordon Byron. 1788-1824.
Childe Harold's Pilgrimage.
Don Juan.
The Giaour.
c. John Keats. 1795-1821.
Endymion.
Eve of St. Agnes.
Hyperion.
Lamia.
d. The Lake School.
William Wordsworth. 1770-1850
Ode on Immortality.
Lines on Tintern Abbey.
The Excursion.
We Are Seven.
Samuel Taylor Coleridge. 1772-1834.
The Ancient Mariner.
Kubla Khan.
Christabel.
Robert Southey. 1774-1843.
Joan of Arc.
Roderick, The Last of the Goths.
The Curse of Kehama.
Percy Bysshe Shelley. 1792-1822.
Queen Mab.
Ode to the West Wind.
Ode to a Skylark.
2. Prose Writers and Their Principal Works.
a. Novelist.
Walter Scott. 1771-1832.
Ivanhoe.
Kenilworth.
Quentin Durward.
Guy Mannering.
b. Essayist.
Charles Lamb. 1775-1834.
Tales from Shakespeare.
Essays of Elia.

VII. Victorian Age.

1. Poets and Their Principal Works.

a. Alfred Tennyson. 1809-1892.
The Princess.
In Memoriam.
Idylls of the King.
Maud.

b. Elizabeth Barrett Browning. 1806-1861.
Sonnets from the Portuguese.
Aurora Leigh.
Prometheus Bound.

c. Robert Browning. 1812-1889.
My Last Duchess.
Andrea del Sarto.
The Ring and the Book.
Rabbi Ben Ezra.

d. Thomas Babington Macaulay. 1800-1859.
Lays of Ancient Rome.
The Battle of Ivry.

e. Jean Ingelow. 1820-1897.
Divided.

2. Prose Writers and Their Principal Works.

a. Historical.
Thomas Babington Macaulay.
History of England.
Henry Hallam. 1777-1859.
Constitutional History of England.
James Anthony Froude. 1818-1894.
History of England.
Thomas Carlyle: A History.

b. Essayists.
Thomas DeQuincey. 1785-1859.
Confessions of An Opium Eater.
Joan of Arc.
The English Mail Coach.
Thomas Carlyle. 1795-1881.
Sartor Resartus.
French Revolution.
John Ruskin. 1819-1900.
Seven Lamps of Architecture.
Stones of Venice.
Sesame and Lilies.

c. Theological.
John H. Newman. 1801-1890.
Apologia pro Vita sua.
Lead Kindly Light.
C. H. Spurgeon. 1834-1892.
The Saint and His Saviour.
Speeches at Home and Abroad.

d. Scientific.
Sir William Hamilton. 1788-1856.
Discussions on Philosophy and Literature.

Sir Charles Lyell. 1797-1875.
Elements of Geology.
Antiquity of Man.
Charles Darwin. 1809-1822.
Origin of Species.
Descent of Man.
Thomas Huxley. 1825-1895.
Man's Place in Nature.
Elements of Comparative Anatomy.
Herbert Spencer. 1820-1902.
First Principles.

e. Novelists.
Charles Dickens. 1812-1870.
Pickwick Papers.
David Copperfield.
Nicholas Nickleby.
William Makepeace Thackeray. 1811-1863.
Henry Esmond.
The Newcomes.
Vanity Fair.
George Eliot. 1819-1880.
Silas Marner.
Adam Bede.
Felix Holt.

VIII. Modern Period.

1. Poets and Their Principal Works.
   a. Dante Gabriel Rossetti. 1828-1882.
      The House of Life.
      The Blessed Damozel.
   b. Matthew Arnold. 1822-1888.
      Sohrab and Rustum.
      Dover Beach.
   c. Algernon Charles Swinburne. 1837-1909.
      A Song of Italy.
      Poems and Ballads.
2. Prose Writers and Their Principal Works.
   a. Charles Kingsley. 1819-1875.
      Hypatia.
      Westward Ho.
   b. Robert Louis Stevenson. 1850-1894.
      Dr. Jekyll and Mr. Hyde.
      Treasure Island.
   c. Rudyard Kipling. 1865-
      The Jungle Book.
      Kim.

American Literature

I. Colonial Period.
1. Poets and Their Principal Works.
a. Anne Dudley Bradstreet. 1612-1672.
The Tenth Muse.
2. Prose Writers and Their Principal Works.
a. Thomas Hooker. 1586-1647.
Fundamental Orders—First Written Constitution.
b. Cotton Mather. 1667-1728.
Witchcraft.
Wonders of the Invisible World.
Magnalia.
c. Jonathan Edwards. 1703-1758.
Freedom of the Will.
d. Benjamin Franklin. 1706-1790.
Poor Richard's Almanac.
Essays.
Autobiography.

II. Revolutionary Period.
1. Poets and Their Principal Works.
a. Philip Freneau. 1752-1832.
The British Prison Ship.
Political Poems.
b. John Trumbull. 1750-1831.
McFingal.
c. Francis Scott Key. 1780-1843.
Star Spangled Banner.
2. Prose Writers and Their Works.
a. Alexander Hamilton. 1757-1804.
The Federalist.
b. Thomas Jefferson. 1743-1826.
Rights of British America.
Declaration of Independence.
c. James Madison. 1751-1836.
The Federalist.
e. Charles B. Brown. 1771-1810.
Wieland.

III. National Period.
1. Poets and Their Principal Works.
a. William Cullen Bryant. 1794-1878.
Thanatopsis.
My Country's Call.
The Ages.
Flood of Years.
Translation of the Iliad and Odyssey.
b. Henry Wadsworth Longfellow. 1807-1882.
Evangeline.
Hiawatha.
The Spanish Student.
The Courtship of Miles Standish.
c. John Greenleaf Whittier. 1807-1892.
The Barefoot Boy.
Snowbound.
Among the Hills.
d. Edgar Allan Poe. 1809-1849.
Annabel Lee.
The Raven.
e. James Russell Lowell. 1819-1891.
The Commemoration Ode.
The Vision of Sir Launfal.
The Cathedral.
f. Oliver Wendell Holmes.
Old Ironsides.
The Poet at the Breakfast Table.
The Chambered Nautilus.
The Last Leaf.
Wonderful One-Hoss Shay.
g. James Whitcomb Riley. 1853—
The Old Swimmin' Hole.
Afterwhiles.
Rhymes of Childhood.
h. Eugene Field. 1850-1895.
Little Boy Blue.
Jes' 'Fore Christmas.
Seein' Things.
2. Prose Writers and Their Principal Works.

Historians.
a. George Bancroft. 1800-1891.
The United States of North America.
History of the Revolution in North America.
b. Richard Hildreth. 1807-1891.
The White Slave.
History of the United States.
c. William H. Prescott. 1796-1859.
Conquest of Mexico.
Conquest of Peru.
d. John L. Motley. 1814-1877.
The Rise of the Dutch Republic.
The United Netherlands.
e. Francis Parkman. 1823-1893.
California and the Oregon Trail.
The Jesuits in North America.
Montcalm and Wolfe.
f. John Fiske. 1842-1901.
Outlines of Cosmic Philosophy.
The American Revolution.
g. Theodore Roosevelt. 1858—
American Political Ideals.

Novelists.
a. Nathaniel Hawthorne. 1804-1869.
The Scarlet Letter.
The Marble Faun.
The House of the Seven Gables.
b. James Fenimore Cooper. 1789-1851.
The Spy.
The Pilot.
The Last of the Mohicans.
c. Harriet Beecher Stowe. 1811—1896.
Uncle Tom's Cabin.
d. William Dean Howells. 1837—
A Modern Instance.
Venetian Life.
A Foregone Conclusion.
e. Mary E. Wilkins Freeman. 1862—
Jerome, a Poor Man.
The Portion of Labor.
f. Henry James. 1834—
Daisy Miller.
A Passionate Pilgrim.

ESSAYISTS.

a. Ralph Waldo Emerson. 1803-1882.
   Representative Men.
   The Conduct of Life.
b. Henry David Thoreau. 1817-1862.
   Walden.
   The Maine Woods.
c. William E. Channing.
   Sermons and Reviews.

CRITICS.

a. James Russell Lowell. 1819-1891.
   My Study Windows.
   Among My Books.
b. Edmund Clarence Stedman. 1833-1908.
   The American Poets.
   The Nature and Elements of Poetry.

HUMORISTS.

a. Joel Chandler Harris. 1848-1908.
   Uncle Remus.
   Tales of the Home Folks.
b. Samuel L. Clemens. 1835—
   Innocents Abroad.
   Pudd'nhead Wilson.

MISCELLANEOUS WRITERS.

a. Washington Irving.
   Sketch Book.
b. Bayard Taylor. 1825-1876.
   Travel.
   Translation of Goethe's Faust.
c. J. G. Holland.
   Nicholas Minturn.
   Kathrina.
   Garnered Sheaves.
d. George Ticknor. 1791-1871.
   History of Spanish Literature
   Life of Prescott.
e. Charles Dudley Warner. 1829-1900
   My Summer in a Garden.
   As We Were Saying.
   The Gilded Age.
f. Silas Weir Mitchell. 1829—
   Youth of Washington.
   Hints for the Overworked.
g. Thomas Bailey Aldrich. 1836-1907.
   Cloth of Gold.
   The Story of a Bad Boy.
   Flower and Show.
   Baby Bell.

Drama

I. FORMS.

1. Tragedy.
   a. Subject matter serious or classic.
   b. Language dignified and graceful.
   c. Motive of presentation—purification of passions.
2. Comedy.
   a. Less serious than tragedy.
   b. Treatment somewhat light throughout.
   c. Originally used as means of ridicule.
3. Opera.
   a. General—Dramatic composition set to music and sung by artists, enriched by costumes, scenery, music, etc.
   b. Grand—Usually serious or classical themes. Generally heavy and impressive treatment, although it is sometimes of a lighter vein.
   c. Comic—Light, fanciful or humorous. Treatment light and graceful. Oftentimes means of ridicule.
4. Pastoral.
   a. Aimed at a fanciful portrayal of Arcadian and mythological scenes.
   b. Treatment quiet and in keeping with the subjects.
5. Burlesque.
   a. Depicts dignified and serious subjects of life in a ludicrous manner or vice versa.
   b. Means of satirical criticism.
   c. Modern—Mixture of travesty, vaudeville and ballet.
6. Farce.
   a. More extravagant and ludicrous than the comedy. Any absurdity or improbability is allowable.
   b. Motive—To excite laughter in any event.

7. Mysteries.
    a. Rude dramas presented at solemn festivals; religious in character.
    b. Object—To strengthen Christian church.
    c. Extended from twelfth to sixteenth centuries. Passion play Oberammergau is an example.
8. Moralities.
    a. Allegorical plays. Moral discourses praising virtue and condemning vice.
    b. Object—To influence public sentiment toward right living.

II. Development.

1. Old Testament.
    a. Job.
    b. Songs of Solomon.
2. India.
    a. Drama much inferior to Greek or modern European.
    b. Dramatic poetry elegant and tender. Writings voluminous.
3. China.
    a. Dramatic writings extensive but unknown to other peoples.
4. Greece.
    a. European drama originated in Greece, foremost nation in literature in early times.
    b. Dramas at first were celebrations of festivals of Bacchus, god of wine.
    c. Æschylus, first writer of Greek tragedy, wrought many changes in chorus, number of actors, etc.
5. Rome.
    a. Drama borrowed from Greeks. In a sense imitators.
    b. Became powerful and influènced modern literature more forcibly than did Greece.
6. Italy.
    a. Foundation of the drama as produced by Shakespeare came directly from Italian.
    b. At first classic models were followed.
    c. Great periods were during fourteenth, fifteenth and sixteenth centuries. Noted pastoral dramas were written.
    d. Interest waned in seventeenth century.
    e. Eighteenth century classic tragedy and genuine comedy were restored.
7. France.
    a. 1684 early school of dramatic writings flourished.
    b. Corneille, Racine and Moliere, the distinguished dramatists.
    c. 1820 a new school of art was formed, called the romantic, in contrast to the former classical school. Hugo promoted the former largely.
    d. Writers in this school, Sardou, Dumas, Rostand.
8. Spain.
    a. The drama flourished at the same time as the English and rose to its height at the same time.
9. England.
    a. Last half of the sixteenth century marked the height of the most brilliant period of the English drama.
    b. Writers—Jonson, Shakespeare, Marlowe.
    c. Theaters were shut up for thirteen years by Puritans.

d. With Charles II the drama reappeared. Licentious and degrading treatment.

10. German.
    a. At first merely translations from the French.
    b. Original works appeared later on.
    c. Schiller and Goethe greatest of modern dramatists.

Shakespeare

BIRTH.

1. Born at Stratford-on-Avon, 1564.

PARENTS.

1. Of humble origin; respectable tradespeople; financially well-to-do.

EDUCATION.

1. Best education grammar school offered.

MARRIAGE.

1. Nineteen years of age. In 1592 established in London, engaged in literary work, and also taking some of the leading parts in plays.

CHARACTER.

1. Ben Jonson said: "I loved the man and do honor to his memory, on this side idolatry, as much as any. He was indeed honest and of an open nature; had an excellent phantasy, brave notions and gentle expressions."

WRITINGS.

1st Period.
    a. Experimenting in characterization; looseness in construction. Feeling after his powers and testing them.
    b. Writings—Love's Labor Lost, The Comedy of Errors, A Midsummer Night's Dream, Richard III.

2d Period.
    a. With increased assurance follow his brilliant portrayal of English history and comedy of life in general, and one great romantic tragedy, King Richard II.
    b. Writings—Parts I and II of Henry IV, King John, Romeo and Juliet, The Merchant of Venice, Much Ado About Nothing, As You Like It, etc., etc.

3d Period.
    a. Master of all the resources of his art.
    b. Personal experiences portrayed in writings. Comedy becomes bitter; tragedies black with human experiences.
    c. Writings—Measure for Measure, Julius Cæsar, Hamlet, King Lear, etc., etc.

4th Period.
    a. Attains glad serenity of mind, enabling him to write his last romantic plays.
    b. Writings—Chiefly poetry.

DEATH.

1. Dies in 1616. Buried in Stratford church; a monument with bust and epitaph was soon afterward set up.

QUESTIONS.—LITERATURE.

How was James Fenimore Cooper connected with the navy and consular service of the United States?

Who was the friend of Emerson whose genius in certain respects much resembled that of the philosopher?

What is the nature of Bret Harte's humor?

How was William Dean Howells connected with the foreign administration of the United States?

In what practical way did Washington Irving get the material for his "Tour on the Prairies?"

In which of Elizabeth Stuart Phelps' works appears the problem of woman in professional life?

James Whitcomb Riley began life in what humble way? What is his most famous poem?

What famous novel on social work did Edward Bellamy write?

In what periodical did Mrs. Stowe first publish "Uncle Tom's Cabin?"

What was the hermit period of Thoreau's life?

When was the first edition of Webster's dictionary published?

In what philanthropic work did Walt Whitman ruin his health?

What distinct style of literature did Addison found?

Who described Francis Bacon as the "wisest, brightest, meanest of mankind?"

Which is the longest and most polished of Mrs. Browning's works?

To what romantic circumstances was the publication of Burns' first book of poems due?

For what calling was Carlyle trained? What educational endowment did he make?

Which of Dickens' works embodied his experiences in America?

Which are Henry Drummond's three best-known works?

What was the novel that established George Eliot's high rank?

In the verse of what language is Thomas Gray almost unsurpassed?

What is the elegy in which Shelley has honored his friend Keats?

In what novel do Kingsley's opinions on social and economic questions appear?

At what exceptionally early age was Pope recognized as an able poet?

Which of Charles Reade's novels was directed against the English prison system?

What desire of Walter Scott eclipsed even his literary ambition?

What class of people did Swift try to better and to what end did he bequeath his fortune?

When did Tennyson become poet laureate and what was the first great poem written after the event?

What career did Thackeray first plan for himself and why did he give it up?

To what subject is the literary talent of Israel Zangwill devoted?

What work of Hans Christian Andersen was written by him in English?

What was the period of Goethe's and Schiller's intimate association?

What constitutes the strength and what the defective element in Jean Paul Richter's works?

What was the tragic death of Æsop?

How does Aristophanes rank in Grecian literature?

How did Herodotus prepare himself for his great work? What well-known appellation has been given him?

In which of his writings is Horace at his best?

What was Livy's great purpose in his works?

What peculiar circumstance directed Virgil toward a literary career?

Whose translation of the Æneid has become most popular?

For what reason has the history of Dante's life become half mythical?

Has Dumas a rightful claim to the 1,200 volumes which bear his name?

What is the characteristic of Jules Verne's writings which makes them appeal to readers of all ages?

For what is Emile Zola noted?

What positions did Bjornson and Ibsen hold together during their lives?

What is literature? How old is it?

What is the first account we have of a book? On what was it written?

How old is Sanskrit Literature? Chinese?

What is Poetry? Prose? What is a Lyric? An Epic? A Sonnet? An Ode?

Name the divisions into which prose is sub-divided.

What is the difference between an essay and an oration?

When did Chaucer live? What is he popularly called because of his relation to English Poetry?

When, where, and by whom was printing invented? When was the first book printed?

Where and when was Shakespeare born? When did he die? Where is he buried?

How does Shakespeare rank as a dramatist?

Name five of his most noted productions.

Name five contemporary writers of Shakespeare.

Who wrote "Paradise Lost"?

For what was Spenser noted?

When did Burns live? Name some of his noted poems.

Is Walter Scott more famous for his poems than for his novels? What caused Scott to give up poetry for prose? What are his most famous novels? Name three.

When did Tennyson live? What is the character of his poems?

What famous American orator lived during the Revolutionary War?

For what was Franklin chiefly noted in the field of literature?

Who wrote "The Star Spangled Banner"? "Home, Sweet Home"? "America"?

Who is the best known American poet? Novelist? Essayist? Historian?

For what is James Whitcomb Riley best known?

Name three prose writers and three poets of the United States living today.

Why is the study of literature so important? Give three reasons for your answer.

Why was Whittier called the Quaker poet?

For what production is Oliver Wendell Holmes best remembered? Lowell? Hawthorne? Cooper?

What is known as the Golden Age of French literature?

What was the *Spectator,* and when did it appear?

Why is King Alfred known as the Father of English Prose?

Who were the Minnesingers? With what subjects did their compositions deal?

What is a masque? During what age and in what country were masques especially popular?

To the influence of what nation is to be traced much of the correctness and elegance of the literature produced during the age of Queen Anne?

What is the theme with which the *Iliad* deals? How does this epic rank in ancient poetry?

What is the greatest of the German national epics? Tell the story of this poem.

Gems of Literature

We give here fifty-two selections from as many eminent authors and literary personages. As the pupils become familiar with the world's best thoughts they will unconsciously adopt them as their own and ever be actuated by them. These splendid lessons on character, education, industry, sincerity, truth, wisdom and kindred subjects, supplemented with the lives of their authors, as given in THE NEW PRACTICAL REFERENCE LIBRARY, should prove of inestimable value.

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Talk not to me of the stock whence you grew,
But show me your stock by what you can do.
—*Spurgeon.*

Lost, yesterday, somewhere between sunrise and sunset, two golden hours, each set with sixty diamond minutes. No reward is offered, for they are gone forever. —*Horace Mann.*

Breathes there a man with soul so dead,
Who never to himself hath said,
"This is my own, my native land?"
Whose heart hath ne'er within him burned,
As home his footsteps he hath turned
From wandering on a foreign strand?
—*Sir Walter Scott.*

Do not look for the flaws as you go through life,
And even when you find them,
It's wise and kind to be somewhat blind,
And look for the virtue behind them. —*Wilcox.*

Laziness grows on people; it begins in cobwebs and ends in iron chains. The more business a man has to do, the more he is able to accomplish, for he learns to economize his time. —*Sir Matthew Hale.*

Do the duty which lies nearest thee, which thou knowest to be a duty. Thy second duty will already have become clearer. —*Carlyle.*

I would not enter on my list of friends
(Though graced with polished manners and fine sense,
Yet wanting sensibility) the man
Who needlessly sets foot upon a worm. —*Cowper.*

If a task is once begun,
Never leave it till it's done;
Be the labor great or small,
Do it well, or not at all. —*Phœbe Cary.*

Happy hearts and happy faces,
Happy play in grassy places—
That was how, in ancient ages,
Children grew to kings and sages.
—*Robert Louis Stevenson.*

Diving and finding no pearls in the sea,
Blame not the ocean: the fault is in thee. —*Alice Cary.*

Awake, he loved their voices,
And wove them into his rhyme;
And the music of their laughter
Was with him all the time.

Though he knew the tongues of nations,
And their meanings all were dear,
The prattle and lisp of a little child
Was the sweetest for him to hear.
—"About Longfellow," by *Riley.*

We sow a thought and reap an act; we sow an act and reap a habit; we sow a habit and reap a character; we sow a character and reap destiny. —*Thackeray.*

People seldom improve when they have no other model but themselves to copy after.
—*Goldsmith.*

The only reason we don't see good things everywhere is because we haven't good eyes.
—"A Fool of Nature," *Julian Hawthorne.*

Ah, faithful to Little Boy Blue they stand,
Each in the same old place,
Awaiting the touch of a little hand,
The smile of a little face.
And they wonder, as waiting these long years through,
In the dust of that little chair,
What has become of our Little Boy Blue
Since he kissed them and put them there.
—"Little Boy Blue," *Eugene Field.*

Then here's to our boyhood, its gold and its gray!
The stars of its winter, the dews of its May!
And when we have done with our life lasting toys,
Dear Father, take care of Thy children—The Boys.
—"The Boys," *Oliver Wendell Holmes.*

Do you count your birthdays by the year,
And thank the gods with gladness and good cheer,
O'erlook the failings of your friends, and grow
Gentler and better as your sands run low?
—A Prayer for Health and Content.
Translation from "Horace" by *Conington.*

With malice toward none, with charity for all; with firmness in the right, as God gives us to see the right, let us finish the work we are in—to bind up the nation's wound; to call for him who shall have borne the battle and for his widow and his orphans; to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations.
—Speech at Gettysburg, *Abraham Lincoln.*

He who, from zone to zone,
Guides through the boundless sky thy certain flight,
In the long way that I must tread alone,
Will lead my steps aright.
—"Ode to a Waterfowl," *Wm. Cullen Bryant.*

Errors, like straws, upon the surface flow;
He who would search for pearls must dive below.
—*John Dryden.*

In battle or business, whatever the game,
In war or in love, it's ever the same;
In the struggle for power, or scramble for pelf,
Let this be your motto, "Rely on yourself." —*Saxe.*

Our greatest glory consists not in never falling, but in rising every time we fall.
—*Emerson.*

My son, observe the postage stamp! Its usefulness depends upon its ability to stick to one thing until it gets there. —*Josh Billings.*

But chief of all,
Oh loss of sight, of thee I most complain!
Blind among enemies, O worse than chains,
Dungeon, or beggary, or decrepit age!
Light, the prime work of God, to me's extinct,
And all her various objects of delight
Annulled, which might in part my grief have eased;
Inferior to the vilest now become
Of man or worm the vilest here excel me.
They creep, yet see; I, dark in light, exposed
To daily fraud, contempt, abuse and wrong,
Within doors or without, still as a fool
In power of others, never in my own
Scarce half I seem to live, dead more than half. —*Milton.*

Beware of how you say more than you mean; better mean more than you say.
—*Gladstone.*

The moment I heard of America, I loved her; the moment I knew she was fighting for freedom, I burnt with a desire of bleeding for her; and the moment I shall be able to serve her at any time or in any part of the world, will be the happiest one of my life.
—*Lafayette.*

I steal by lawns and grassy plots,
I slide by hazel covers;
I move the sweet forget-me-nots
That grow for happy lovers.

I chatter, chatter as I flow
To join the brimming river;
For man may come and man may go,
But I go on forever. —"The Brook," *Tennyson.*

It is nearly an axiom, that people will not be better than the books they read.
—*Bishop Potter.*

We grow like what we think of; so let us think of the good, the true, and the beautiful.
—*Phillips Brooks.*

Ponder well, and know the right,
Onward, then, with all thy might!
Haste not! years can ne'er atone
For one reckless action done. —*Goethe.*

I hope I shall always possess firmness and virtue enough to maintain what I consider the most enviable of all titles, the character of an "Honest Man." —*George Washington.*

My idea is this: ever onward. If God had intended that man should go backward, He would have given him an eye in the back of his head. —*Victor Hugo.*

Boys flying kites haul in their white winged birds;
You can't do that way when you're flying words.
"Careful with fire," is good advice, we know;
"Careful with words," is ten times doubly so.
Thoughts unexpressed may sometimes fall back dead;
But God himself can't kill them when they're said.
—*Will Carleton.*

The next gale that sweeps from the north will bring to our ear the clash of resounding arms. Our brethren are already in the field! Why are we here idle? What is it that gentlemen wish? What would they have? Is life so dear or peace so sweet as to be purchased at the price of chains and slavery? Forbid it, Almighty God! I know not what course others may take; but as for me, give me liberty or give me death. —*Patrick Henry.*

So, Willy, let you and me be wipers
Of scores out with all men—especially Pipers;
And whether they pipe us free from rats or from mice,
If we've promised them aught, let us keep our promise.
—"The Pied Piper of Hamelin," *Robert Browning.*

Which is the wind that brings the heat?
The South wind, Katy; and corn will grow
And peaches redden for you to eat,
When the South begins to blow.
—"What the Wind Brings," *Edmund Clarence Stedman.*

He prayeth best who loveth best
All things both great and small;
For the dear God who loveth us,
He made and loveth all. —*Samuel Taylor Coleridge.*

Full many a gem of purest ray serene
The dark unfathomed caves of ocean bear:
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air.
—"Elegy in a Country Churchyard," *Thomas Gray.*

Nothing useless is and low,
Each thing in its place is best;
And what seems but idle show
Strengthens and supports the rest. —*Longfellow.*

Sloth, like rust, consumes faster than labor wears; while the used key is always bright.
—*Benjamin Franklin.*

A mere life of ease is not in the end a satisfactory life, and, above all, it is a life which ultimately unfits those who follow it for serious work in the world. —*Roosevelt.*

Honor and shame, from no condition rise;
Act well your part, there all the honor lies. —*Pope.*

Not what we give, but what we share,
For the gift without the giver is bare;
Who gives himself with his alms feeds three—
Himself, his hungering neighbor and me. —*Lowell.*

Be good, dear child, and let who will be clever,
Do noble things, not dream them all day long;
And so make life, death, and that vast forever
One grand sweet song. —*Chas. Kingsley.*

Strike—for your altars and your fires;
Strike—till the last armed foe expires;
Strike—for the green graves of your sires,
God—and your native land! —*Fitz Greene Halleck.*

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows, and in miseries. —*Shakespeare.*

He smote the rock of the national resources, and abundant streams of revenue gushed forth. He touched the dead corpse of Public Credit, and it sprang upon its feet.
—Speech on Hamilton, March 10, 1831.—*Webster.*

But words are things, and a small drop of ink,
Falling, like dew, upon a thought, produces
That which makes thousands, perhaps millions, think. —*Byron.*

Unanchor'd ships, they blow and blow,
Sail to and fro, and then go down,
In unknown seas that none shall know,
Without one ripple of renown.
Poor, drifting dreamers sailing by,
They seem to only live to die. —*Joaquin Miller.*

I care not that sharp thorns grow thick below
And wound my hands and scar my anxious feet:
I only care to know God's roses grow,
And I may somewhere find their odor sweet.
—"Care and Carelessness," *Frank W. Gunsaulus.*

Every difficulty that is overcome by a pupil's own efforts tends to develop in him an ambition to conquer other difficulties. Few, if any, joys can be compared with the ecstatic joy of victory. —"Thinking and Learning to Think," *Schaeffer.*

He teaches best who enables his pupils to dispense with his aid as he governs best who makes his rule unnecessary. —*Bishop Spalding.*

Reading

As READING constitutes the basis of the greater part of our knowledge, an important factor in the formation of character, the source of much of our enjoyment and happiness, the means of promoting individual and national growth, it has been our aim in the light of its importance to give it a thorough and interesting treatment in THE NEW PRACTICAL REFERENCE LIBRARY.

Every intelligent parent knows the importance and difficulty, in these days of many books and sensational newspapers, of making a wise selection for his children's reading. It is almost an axiom that the boy who is provided with good books will not select the worst for himself.

It is our belief that parents will welcome the splendid list of books found under the sub-topics in the article on "Reading." These lists have been most carefully selected, prepared and classified to fit the various grades and ages. Such books are bound to exert an influence of lasting good and, what is of far greater value, form a love for good reading. The topical list for adults is also very complete, taking up in turn works of standard authors of fiction, poetry, essays, dramas, etc., together with English and American authors in general. The reader is also referred to the general subject of LITERATURE, the treatment of which is closely allied to that of READING. It will thus be clear that by looking up correlated subjects and acquainting oneself with the various authors mentioned one is led into a very broad and practical field of valuable and entertaining study.

OUTLINE.

I. GENERAL PURPOSES.
   1. Thought-getting.
   2. Thought-giving.
   3. A love for good literature.
   4. Training powers of mind.
      a. Memory.
      b. Will-choice or selection.
      c. Imagination.
      d. Thought.
      e. Culture in general, polish and fluency in talking, etc.
   5. Acquiring practical knowledge.
   6. Mental, moral, spiritual and physical growth.
   7. Influencing others.

II. EARLY YOUTH.
   1. Primary.
      a. Acquiring thought—learning to read.
         Methods.
            Study.
            Recitation.
      b. Material.
         Course of study in public schools or other institutions.
         Supplementary reading suited to age. (See List.)

c. Objects.
Correct pronunciation.
Natural tones.
Correct expression.
Knowledge of words.
Excite interest for further work.

III. Youth.

1. Intermediate and Grammar Grades.
a. Purposes.
Fluency in oral expression.
Mastery of thought.
Love of good literature.
Cultivation of choice.
b. Methods of teaching.
Sustain interest.
Intellectual element.
Discussions and explanations.
Historical and geographical setting.
Understanding of all allusions.
Comprehension of subject matter.
Appealing to imagination.
Reference work taken up to great extent.
Supplemental reading on all subjects. (See List.)

IV. Adult.

1. Attitude of mind.
a. Interest.
b. Enjoyment.
2. Cultivation of taste continued.
a. Means.
Best authors.
Beauty of expression.
Worthy concepts of life.
Noble sentiments.
Instruction.
Indulgence, individual tastes.
Dangers of.
Advantages of.
Enjoyments of.
Importance of.
3. Results of correct reading.
a. Usefulness in world.
Home.
Business.
Social.
b. To oneself.
Development.
Moral.
Intellectual.
Spiritual.
Physical.

V. Books for Young Folks.

1. See lists given.
a. Primary.
Hiawatha Primer.—Holbrook.
Classic Stories for Little Ones.—McMurry.
When Life Is Young.—Dodge, etc., etc.
Fables and Tales.—W. F. Rocheleau.

b. Intermediate grades.
A Dog of Flanders.—Ramee.
Hiawatha.—Longfello w, etc., etc.
Merry Adventures of Robin Hood.—Pyle.
c. Grammar grades.
Works by the following authors: Irving, Whittier, Holmes, Cooper, Field, Lowell, Shakespeare, Twain, Church.
d. High school.
Competent to select their own reading from standard literature of all countries and authors. (See list in NEW PRACTICAL REFERENCE LIBRARY under reading literature.)

VI. BOOKS FOR ADULTS.
1. For suggestive lists see sub-topics under Reading of
a. Fiction.
b. Narrative poems.
c. Essays.
d. Dramas.
e. American and English literature.
2. See also LITERATURE.

QUESTIONS.

What great influence have state and national libraries had upon the world?

Turn to the subject of Libraries in THE NEW PRACTICAL REFERENCE LIBRARY and notice what the world is doing along this line.

Have you a library in your town? Your county? What factor are you in its growth?

What is being done along practical lines with the reading circles, etc.?

What is the history of the Library of Congress? Name some noted libraries of the United States.

Why are elaborate courses of reading often failures?

What factor is interest in the subject of reading? How may this be cultivated? Is individual taste a strong factor in interest?

What are the dangers of indulgence in individual taste?

Why and how should individual taste be cultivated? How is this taste expressed in literary writings?

What are the literary merits of a work? Where do we find these in perfection? Do they appeal to all alike? Why not?

How can we cultivate an appreciation of literary style?

When and how is time wasted in reading?

Is it necessary that all reading be of the instructive order?

What style of reading appeals directly to the emotions? Why is it essential that this class of literature be of the best?

What does the novel portray? What is its scope? What importance is it in education? Name standard novels with their authors.

What powers of the mind are exercised in the reading of an essay? How does it affect the life outwardly? What are some noted essays and by whom were they written?

What influence has the reading of poetry upon the life?

Suggestions on Reading

The basis for all instruction in school work is reading, since to understand any subject it is necessary for the pupil to be able to read intelligently. The suggestions which we offer here will not be an exposition of the various methods now in use; we feel quite sure that every progressive teacher is more or less familiar with the different methods. The one thing in particular that we have in view is the creating of interest in this recitation. We have emphasized throughout the EDUCATOR the necessity of variety in the securing of interest, and for the assistance of the beginning teacher and the one not gifted with originality we supply a list of one hundred suggestions and devices which, if intelligently used, will insure an interest which cannot be secured where no new methods are introduced.

That the reading exercise may not conduce to bad habits it is essential that careful attention be given to the selection of the reading matter and that it be adapted to the student's needs. We believe the thoughtful teacher will give every attention to this important matter, and by spicing this exercise with the suggestive material here presented, every lesson will prove an inspiration and result in especially fitting the pupil for the understanding of other subjects, since reading must enter largely into this knowledge.

Be sure that pupils are thoroughly familiar with all the words in the lesson, their pronunciation and meaning, before expecting them to read a selection correctly.

The teacher should study the sense of the piece and see that the pupil understands it also.

Remember that reading, not elocution, is the subject to be taught.

Beginners should not have too many new words presented to them at once.

There is a possibility of laying too much stress upon exactness in some vowel sounds.

It is advisable that pupils should stand while reading, that the teacher may see the entire person and be able to criticize the position.

Monotony of expression can be remedied by having the pupil read with the teacher and by persistent drill.

Reading by the individual is always more important than reading by the whole class.

Cultivate a feeling of ease and freedom from embarrassment on the part of the pupil; it will help him greatly.

Care should be taken not to train the pupil merely to imitate the teacher in reading after her.

Pupils must be trained to take in the sense of a line at a glance. This is absolutely necessary to insure intelligent reading.

Allowance must be made for natural weakness or other defects in the voice.

Let the teacher give several sounds common to a number of words and then ask the pupils to give the words containing them.

Pay careful attention to the position of the pupil while reading; he should stand straight, well balanced on his feet, and holding the book easily at a proper distance from his eyes.

Practice should be had in giving the elementary sounds when the word is spoken, and vice versa.

Let the pupil form words by combining vowels with consonants given him by the teacher, and vice versa.

Let the pupils reproduce in correct spelling words written phonetically on the board by the teacher; or let them spell the word phonetically from seeing it written in the ordinary way.

Have the class form other words from seeing the sounds of one word indicated phonetically on the board.

The pupils should be allowed, even encouraged, to criticize one another, but always in the right spirit.

Let the same paragraph be read in succession by different members of the class, and let corrections be suggested on the reading of each before the next reads.

The teacher's first duty is not to criticize nor to judge the pupil's work, but to teach him to appreciate the beauties of the selections being read, and to read them himself in such a way that others may appreciate them also.

Mistakes in pronunciation should be corrected wherever and whenever they occur.

Wherever possible the teacher should, by comment, explanation and illustration, connect the matter of the reading lesson with the every-day life of the pupil.

Exercises in spelling will often enliven the reading lesson.

Questions on the reading lesson should be adapted to make pupils observe and think for themselves.

Most interesting reading matter may be found in historical stories.

Train the pupils often and thoroughly in pronouncing elementary sounds, syllables and words chosen for the purpose.

Young children cannot be expected to profit much by rules; they can learn best by imitating the teacher. Her pronunciation, therefore, should be perfect.

Encourage the pupils at all times to seek help in pronouncing difficult words and be ever ready to assist them.

The vocal organs of the children will receive no training that the teacher does not give them.

Advantage may be derived from hearing children with similar voices or faults read in the same division.

Do not fail to illustrate the thought of each paragraph so plainly that every pupil will comprehend it.

Every helpful, ennobling thought occurring in the lesson or suggested by it should be strongly impressed upon the pupil.

Dialogues will be found well fitted for reading lessons. Assign a part to each pupil and make a special effort to secure the best expression possible.

At times, especially in reviews, allow one pupil to read several paragraphs without interruption. It will tend to give him ease and freedom in reading.

The pupils should be questioned on the points of the story, both at the opening of the recitation and during its progress.

It may be well to mark emphatic words on the page, or have them written on the board, and see that in the reading they get the emphasis due them.

Effort should always be made to secure the interest of parents in having the children take their books home and read there.

As the primary object of learning to read is to secure information, getting the thought of the paragraph should be considered as of even more importance than correct pronunciation.

A fault should never be corrected without showing the pupil the right way. The lesson should be carefully looked over by the teacher in advance and no lesson beyond the powers of the pupils assigned.

It may be well in particular cases to make use of exercises chosen especially for their difficulty and drill the pupils systematically in pronouncing these difficult sounds.

Great benefit will be derived and a special effort will be secured by having certain pupils take a conspicuous place before the class and read a selection, being then criticized by all.

Careless enunciation should never be tolerated.

Have the teacher give the meaning of certain words occurring in the lesson, and with this information let the pupils locate the word.

Renewed interest can be secured by taking a good story from a magazine, cutting it up and passing the pieces around to be read by the pupils in class.

Have the pupils suggest synonyms for suitable words occurring in the lessons.

Patience must be exercised with the slow and dull.

It may be discouraging to a pupil to interrupt him while reading in order to correct him. Good judgment must be used in this.

Let each pupil present a list of words which he found difficult to pronounce; then have the brighter pupils try them, before the teacher.

Let the pupils give words of opposite meaning to difficult words occurring in the day's lesson.

The pupils may be asked to change statements to questions and affirmations to negations, etc. They may also be asked to change stanzas of poetry to prose.

Older pupils may be required to write a whole paragraph in other words than those used in the book, but giving the same sense.

Draw the pupils' attention to the different literary qualities by having them select paragraphs especially illustrative of those qualities.

Show the importance of punctuation by special sentences, such as the following: "What, do you think I can walk to school in the rain?" "What do you think? I can walk to school in the rain."

Constant drill should be given to remedy reading too fast or too slowly.

Do not neglect any opportunity of enlivening the lesson and broadening the pupils' information by having them look up all references to history, science, etc.

Where occasion offers, show how a different meaning may be given to the same words by altering the emphasis.

The pupil should not be expected to profit by the exercise of reading a whole paragraph aloud after the teacher; take a sentence only, or a clause.

Endeavor to have the pupil feel confidence in himself; it will make his reading easier for him.

Pupils can be taught to read more slowly by having them make a pause after each word, or by having each pupil read a word in turn.

Give your pupils occasional drill in such fundamental things as the sounds of the letters, pitch, stress, etc.

Require correct spelling of all or a part of the words in the lesson each day.

Plan your work carefully at least one day ahead.

Increased interest can always be secured by introducing some supplementary reading.

Make as much study as circumstances will permit of the lives of the authors read in the supplementary work.

Have one pupil read until a mistake is noticed by one of the others; then let the latter continue the reading.

At times have the older pupils in succession take charge of the class and conduct the recitation, the teacher always guiding the work.

Have a slow reader and a rapid one read together and insist on their keeping together.

Beware of drilling some one pupil too long on the same thing. He must not be tired out or discouraged.

Another useful exercise to remedy too rapid reading is to have the pupil read backward.

Endeavor to look at the difficult things from the pupil's standpoint as well as from your own.

Show the pupil just how the incorrect manner of reading impresses the hearer by reading incorrectly aloud yourself.

Allow the pupils occasionally, where it seems advisable, to suggest readings from papers or magazines, and vary the work by having these read in class.

Have some especially good pieces of literature, both prose and poetry, committed to memory by all.

Consider that method best which brings into the class the most interest and effort, and to the pupils the greatest improvement in reading.

With very young children it will be well to read to them considerably, rather than to tire them by too much drill.

Select your supplementary reading matter with a view, at least partly, to the educational value of the information it contains.

With older pupils have supplementary selections read in class by certain ones, and lay stress on the importance of learning to read as a means of acquiring information.

You should have in your school library books especially chosen for their fitness for use in supplementary reading, on such subjects as science, manufactures, business, transportation, history, literature, biography, etc.

Do not work directly through your reader in the order there used with any one class, but alternate the selections of the reader with the supplementary work.

Strive in every way possible to develop the imagination of the children; teach them to picture in their minds what they read.

Have narrative selections in which conversation occurs put into dramatic form, and vice versa.

Vary the reading matter to meet the interest of the children; they cannot profit by reading a selection in which they are not interested.

Give the older pupils constant training in using the dictionary.

Much interest can be introduced into the reading lesson with older pupils by having occasional exercises in the derivation of words and their analysis.

If you can create an interest among your pupils to read the books in your school library you will secure greater interest in the class work also.

While reading the simple American classics, put to the pupils questions on the text, having them answer in the words and expressions of the author, as describing characters, situations, etc.

In this work in the classics among the older pupils, freedom of discussion on characters and plot should be encouraged, and possibly debates should be arranged on similar subjects.

It may be that you can interest your pupils in drawing on the blackboard scenes illustrative of the text.

The acting out of some part of a classical play read with the advanced classes may sometimes be done to advantage; or of some poem or story that the class has dramatized.

The assigning of definite topics to be prepared by the pupils will be found to be helpful in studying the classics.

Ask questions on the text that will make the pupils think and see the important points, qualities or characteristics.

In a library of fifty, or even thirty, well chosen volumes you may possess infinite riches, and means for a lifetime of enjoyment.

Law and Politics and Business

All men should know as much of the ordinary law as protects their common and universal rights, a general understanding of how to make agreements, conduct sales, draw notes, and such principles of business law will prevent, every day, important mistakes leading to loss. Our course gives one a valuable foundation for the understanding of these questions, and ought to be mastered by every teacher and every student of sufficient age to understand business transactions. It deserves, indeed, a place in every household.

Law

I. CLASSIFICATION.
   First Classification:
   1. International law.
   2. Constitutional law.
   3. Administrative law.
   4. Special classes.
      a. Roman.
      b. Civil.
      c. Salic.
      d. Commercial.
      e. Parlimentary.
   Second Classification:
   1. Common law.
   2. Equity.
   3. Statute.

II. ADMINISTRATION.
   1. Procedure.
   2. Offenses and punishments.

III. LAWS CONCERNING SPECIAL RELATIONS.
   1. Husband and wife—Marriage; Divorce.
   2. Parent and child.
   3. Master and servant.
   4. Landlord and tenant.

IV. MISCELLANEOUS LEGAL TERMS AND USAGES.

The general article LAW contains the two classifications shown in the outline, with a statement or definition of each. Besides this, there is a long article on INTERNATIONAL LAW, with reference to other important departments, such as WAR; NEUTRALITY; TREATY; DIPLOMACY; MONROE DOCTRINE; PEACE CONFERENCE; INTERNATIONAL, etc. There are also articles on each of the special classes shown in the outline, and comprehensive articles on COMMON LAW; EQUITY and STATUTE, showing the evolution of each.

Besides a long article on PROCEDURE, which shows the exact order and significance of the steps in bringing a case to trial, there is an article on COURTS, including classification; one on JURY; and TRIAL BY JURY, and many others upon minor topics, such as APPEAL; WRIT; EVIDENCE; BAIL; WITNESS; WARRANT, etc. Most of these are referred to in the longer articles so that they are easily found.

Besides an extensive article on CRIME, there are briefer articles on all of the

important ones, from MURDER to BLACKMAIL, ARSON and ASSAULT AND BATTERY, in each of which the distinguishing features are shown as clearly as possible, and the usual punishments. Frequent references are made to separate articles on punishments, crimes and remedies for other offenses, including CAPITAL PUNISHMENT, DAMAGES, PRISON, FINE, etc. The special relations noted in the outline are covered by long articles, the fourth, or the relation of landlord and tenant, being placed under the titles TENANT and LEASE. The others have the titles given.

The division called in the outline MISCELLANEOUS LEGAL TERMS AND USAGES includes a great variety of titles frequently referred to in the other articles mentioned, but also of interest and value in themselves. Among the titles are ESTATE; REAL PROPERTY; PERSONAL PROPERTY; BANKRUPTCY; ATTAINDER; COPYRIGHT; PATENT; WILL; DESCENT; PENSIONS; HOMESTEAD LAWS, and others.

Government

I. FORMS.
II. BRANCHES AND DEPARTMENTS.
III. OFFICES AND TITLES.
IV. ACTIVITIES, PROBLEMS AND RELATED TOPICS.

In the article GOVERNMENT, the classification of government is given. The most important kinds are given separate articles also, and the variations in the governments of different countries are given in the articles upon those countries.

Articles are devoted to the three branches of government—executive, legislative and judicial, and special articles to subdivisions of the former. Referred to from Government, governmental theories are discussed under the article State. Many offices and titles used in speaking of government are described in separate articles, and all of the most important ones are so given. In the last division of this branch of the subject, such questions as CIVIL SERVICE AND CIVIL SERVICE REFORM; COLONIES AND COLONIZATION; THE CONSTITUTION OF THE UNITED STATES; DEAD LETTER OFFICE; NATIONAL DEBT; DIVINE RIGHT OF KINGS; LANDS, PUBLIC; MUNICIPAL GOVERNMENT, are included.

Commerce

I. FORMS.
II. INSTITUTIONS.
III. USAGES.

Under the subject COMMERCE the important terms and institutions are described in separate articles, besides being generally outlined in the article COMMERCE. Among the subjects discussed which, from their nature, must be handled independently are INSURANCE; BANKS AND BANKING; CLEARING HOUSE; AGENCY; CARRIER, COMMON; CONTRACTS; CORPORATION; CREDIT; JOINT STOCK COMPANIES; NEGOTIABLE INSTRUMENTS; PARTNERSHIP; SAVINGS BANKS; BOARD OF TRADE; COMMERCE, CHAMBER OF; ADVERTISING; ANNUITY, and many related topics.

What is commerce?

When did it lead to the development of the merchant? At what time did its growth necessitate markets and fairs?

Describe first means of commerce. Mode during Middle Ages. Effect of Crusades on commerce.

When did trade between nations begin to assume its present world-wide importance? To what two causes was this impetus due?

How did advancement in the science of navigation lead to an increase in the world's commerce?

Why did the restriction of commerce between European nations and their colonies prove unprofitable?

What acts restricted the commerce of the American colonies before the Revolutionary War?

To what great event in the history of our country did this lead?

From what year does the commerce of the United States as a nation date?

First decade:

a. Amount of imports.

b. Amount of exports.

When did our commerce begin to develop rapidly?

Which is greater, the internal or foreign commerce of the United States?

Reasons for this:

a.

b.

c.

d.

How does our internal commerce compare with that of other countries?

What period of time has been remarkable for commerce development?

How did the imports and exports of the United States for 1905 compare with those of France? Of Germany? Of Japan?

Through what waters would a cargo of wheat pass in going from Duluth to Constantinople?

Name two products of your own county exported abroad.

Related Subjects (which see).

a. Chamber of Commerce.

b. Department of Commerce and Labor.

When organized.

Duties.

c. Commercial education.

Sociology and Economics

I. Political Economy.
II. Industrial and Social Principles, Institutions and Movements.

The subject of Political Economy is outlined fully in a long article under this title. From this, references are given to important divisions of the subject and to some common terms, such as Capital; Interest; Wages; Rent; Tax; Value; Population; Statistics; Money; Gresham's Law, and others. The second division of the subject is briefly outlined in the article Sociology, from which references are made to a great many related topics, such as Anarchists; Communism; Coöperation; Factory and Factory Legislation; Illiteracy; Immigration; Labor Organizations; Monopoly; George Junior Republic; Social Settlements; Trusts; Woman's Rights; Convict Labor; Socialism, and others. This division of this branch of the subject is exceptionally complete.

Historical Topics

I. Political Parties and Other Organizations.
II. Events Closely Related to Politics or Sociology, Including Great Expositions.

In the last division of this branch of the subject are included brief articles on the origin and principles of the great political parties, especially of America

and England. There is also an extended article on political parties in the United States, showing their relations to each other, from the formation of the government to the present time. This branch also includes events chiefly of political or sociological interest, such as BLUE LAWS; CORN LAWS; DARTMOUTH COLLEGE CASE; DARIEN SCHEME; FEUDAL SYSTEM; HOME RULE; KU-KLUX KLAN; STATES' RIGHTS; TAMMANY SOCIETY, and similar topics.

Banks and Banking

KINDS.
National.
(a) When organized
(b) Minimum capital
(c) Supervision
(d) Number in 1900
(e) Capital in 1900
(f) Deposits in 1900
State and Private.
(a) Capital
(b) Supervision
(c) Number
(d) Deposits
Meaning of.
Check
Draft
Exchange
Deposit

PURPOSES AND FUNCTIONS.
(a)
(b)
(c)

Results.
(a)
(b)
(c)

NOTED BANKS.
Bank of England.
(a) When incorporated
(b) Original capital
(c) Present capital
(d) Present deposit
(e) Present loans
Bank of France.
(a) Established
(b) Security
(c) Government aid

HISTORY.
Banks B. C.
Roman
Venice
Original purpose
First bank in United States.

TEST QUESTIONS ON BANKS AND BANKING.

What is a check? A draft? A certified check?

Does an endorsed check by the payee constitute a receipt?

What is negotiable paper?

Are National banks prohibited from loaning money on mortgages?

How many persons are necessary to organize a National bank? What is the minimum capital?

Can National banks issue notes for circulation to the full amount of their bonds?

In what particular does the banking system of the United States differ from that of other leading countries?

How many National banks in the United States in 1905? How many State banks? Private banks?

What were the respective total deposits of each at that time?

When was the first bank chartered in the United States?

When was the first National bank organized in the United States?

Where and with what capital?

What are Savings banks? When and where first organized in the United States of America?

What are Trust Companies?

QUESTIONS—LAW AND POLITICS.

Why should all citizens be informed in regard to law? To what extent?

Upon what is law based? How and where did the idea originate?

What is meant by common law? Equity? Statutory law? International law?

The following are classed under what kind of corporations: Park boards, school boards, boards of colleges, hospitals, charitable associations, etc.?

Of what are labor unions the result? What are their objects? What have they accomplished? Along what two distinct lines do they work? What are the evils and benefits? How are they regarded by the world in general today as compared with their standing some years ago?

What is known as pooling? In forming a trust, what are the principal aims?

What effect does competition have on business?

Name some beneficial results of trusts to the public. What evils follow?

Name some trusts that affect the public directly. That affect them indirectly. What are some of the large trusts of the United States?

What is the important feature concerning obligations of corporations? What are the two main classes?

In what did courts have their origin?

Name the courts of the United States in their order and the action taken by each during a trial. Name persons participating in a trial.

In a criminal case who is the plaintiff?

What is international law? Why is it necessary?

What are some of the rights and duties of a nation during peace? During war?

What do we mean by politics? What are the two great political parties in the United States? In England? For what does each stand?

What are the minor political parties? What do they represent? Name the statesmen of the United States who have had a powerful influence over the politics of the nation in their time. What great reforms have been accomplished through them?

What do we mean by the term municipal government? By whom is it administered? What authority and control has it?

What is meant by municipal ownership? Is this a world-wide question at present? Along what lines is it being agitated?

What lines of work are performed by those engaged in civil service? Give some of the rules governing the applicants.

What did Hayes do along the line of civil service reform? With what evil does this largely do away?

In what way is immigration an evil? In what way beneficial? To what extent is it being restricted?

What part is socialism taking in the politics of today? Give evils and benefits of this order.

What is your county seat? What are the names of the officers of your county?—commissioners, auditor, register of deeds, treasurer, superintendent of schools. What are their duties?

What are your township officers? What are their duties?

JURY AND TRIAL BY JURY.

What is the meaning of trial by jury? When and where did it originate?

What is the grand jury? Petit jury? What is a panel? What is an indictment?

What does the jury do in case the accusation is unfounded? How many men compose a jury?

How are jurors chosen? What happens to a juror accused of treason?

How do they consider the evidence? What happens when the jury fails to agree?

Why is a coroner's jury called? What is its duty? Its size?

How many men in a petit jury?

Board of Trade

MEANING.—What is the Board of Trade?

PURPOSES for which it was first organized:

a.

b.

c.

EUROPEAN BOARD OF TRADE:

When and where first organized?

What city was the first in the world to establish a board of trade?

How did it differ from the board of trade of today?

When was the Chamber of Commerce of Paris established?

Where is the oldest chamber of commerce in Great Britain?

What chamber of commerce is the grand center of the commerce of the old world?

With what exchange do American commercial dealers have the most direct connection?

Name three other leading British exchanges.

AMERICAN BOARD OF TRADE:

When and where first established?

Name in the order of their rank the American boards of trade.

When was the Chamber of Commerce of New York established?

Name the principal boards of trade in the west after Chicago?

When was the Chicago Board of Trade organized, and with how many members?

What is meant by trading on "margins?" Explain the process.

Why do most boards of trade have their own clearing houses?

BASIS OF GRADING:

Why is a strict basis of grading and inspection of wheat observed?

Give a complete table of grading wheat.

With regard to what other grains is the same close discrimination made?

What regulations are made to prevent fraudulent practice on the board of trade?

What are the rules of the board regarding property bought and sold on the floor?

When does a board of trade contract mature?

What is the distinction between *long* and *short* transactions?

CORNER.—What is meant by "corner?" How created? For what purpose? Name memorable wheat corners on Chicago Board of Trade.

SIGN LANGUAGE USED BY BROKERS:

Open hand signifies what?

Back of hand signifies what?

One finger raised means how many bushels?

Two fingers raised means how many bushels?

What is a pit? What is a Bear? A Bull? (which see.)

How and when are settlements made for transactions on the board?

CORPORATIONS.

What is a corporation?

Have the individual members the same rights and duties as the corporation?

Is a corporation dissolved by the death or withdrawal of members?

What is the distinguishing feature of corporations as compared with other associations and societies?

From what law has the conception of a corporation been taken?

I. Public Corporations.

1. States.
2. Cities.
3. Counties.
4. Villages.
5. Parks, etc.

II. Private Corporations.

1. Benefit of Members.
   - Social.
   - Artistic.
   - Scientific.
   - Religious.
2. Pecuniary Profit.
   - Railroad companies.
   - Telegraph companies.
   - Telephone companies.
   - Banks.
   - Insurance, etc.
3. Mutual Aid and Relief.
   - Building and loan.
   - Lodges.
   - Coöperative societies, etc.
4. Incorporated Trusts.
   - Colleges.
   - Hospitals.
   - Charitable institutions.

INSURANCE.

How old is insurance? What kind was first used?

Who is the underwriter? What is the premium?

What is marine insurance?

If goods insured are removed from a burning building and are damaged who loses?

Is a loss by lightning the same as by fire? Why did life insurance originate?

What is an endowment policy? What is the tontine policy?

What are examples of a corporation for the benefit of the members?

What is the basis of a corporation for the pecuniary profit of individual members?

How are such corporations regulated? To what are their transactions limited? How are the profits divided?

Give examples of this class of corporations.

What is the first object of corporations for mutual aid and relief?

How are such corporations generally controlled? What are examples of this class?

What are examples of incorporated trusts?

How is a corporation usually formed?

Give four conditions under which a corporation may be dissolved.

In all such cases what becomes of the lands of a corporation?

To what laws are corporations liable?

What privileges does the constitution of the United States prohibit?

What is one of the first principles of corporation law?

What by-laws has a corporation power to make? With what must these by-laws be in harmony?

Every person has two educations—one which he receives from others, and one, more important, which he gives himself. —*Gibbon.*

Machines and Engineering

Under the general subject of ENGINEERING we have called attention to the different departments and outlined the work of each. Under CIVIL ENGINEERING we include all kinds of construction other than military and naval. These topics are treated under their separate heads, as CANALS, RAILROADS, HARBORS, WATERWORKS, IRRIGATION, etc.

As TRANSPORTATION is really a subhead of ENGINEERING, a study of our Outline on TRANSPORTATION will be beneficial, as will also the article itself in THE NEW PRACTICAL REFERENCE LIBRARY. together with its subheads. This is one of the most important questions of the day, of interest both to the individual and nation alike, and a close examination of the different lines of work as described in the LIBRARY ought to give a very comprehensive view of the situation in the engineering world today.

In connection with our outline of ENGINEERING we append the names of important machines which constitute such an important factor in the problems confronting ENGINEERING today. These are treated fully under their own heads.

ENGINEERING.

I. DEFINITION.
II. HISTORY OF.
III. GENERAL PURPOSE.
    1. Construction of
        a. Large buildings.
        b. Bridges.
        c. Canals (see Outline).
        d. Harbors.
        e. Railroads (see Outline).
        f. Street railways.
        g. Telegraph (see Outline).
        h. Telephone.
        i. Waterworks.
            Aqueduct.
            Irrigation (see Outline).
IV. DIVISIONS.
    1. Civil Engineering (see "Construction of," above).
        a. Electrical.
        b. Mechanical.
        c. Sanitary.
    2. Military Engineering.

a. Construction of roads, fortifications and other defenses for country.

3. Marine Engineering.

a. Construction of ships and other naval affairs.

V. MACHINES.

Flying Machine.
Compass.
Corn Harvester.
Cotton Gin.
Gas Engine.
Hydraulic Engine.
Hydraulic Ram.
Knitting Machine.
Linotype.
Monotype.
Locomotive.
Magic Lantern.
Microscope.
Phonograph.
Printing Press.
Reaping Machine.
Sewing Machine.
Separator—Cream.
Snow Plow.
Solar Engine.
Steam Engine.
Steam Hammer.
Steam Shovel.
Steam Turbine.
Threshing Machine.
Turbine Wheel.
Type.
Typewriter.
Voting Machine.

QUESTIONS.

In the construction of railways what are some of the obstacles to overcome by means of engineering?

In what enterprises would an electrical engineer be employed?

Name some of the machinery in use on a farm and in each case tell of the labor saved.

What ruins in Egypt attest to skill in engineering? In Rome? In Babylon?

What machines have you seen in your town? In what respect are they labor-saving?

What record has Santos Dumont made in aerial navigation? What part did his airship take in the St. Louis exposition?

Is the airship at present of any practical importance? What is said of its future?

What is a compass? Where is it necessary to use one? Why?

Compare the amount of work accomplished by the cotton gin in one day with that of one person for a day.

How did this invention affect the world?

In the gas engine what materials are used to generate the gas?

In what cases is an hydraulic engine preferred?

When is it practicable to use an hydraulic ram?

The knitting machine is used in what factories?

What is the linotype? It does the work of how many men working by hand?

Why and in what work is the monotype preferred to the linotype?

To what particular use is the magic lantern put?

For what is a microscope used? Its use would be an aid in what studies?

What is a phonograph? How does it differ from a graphophone? Is it ever used in business?

What are some of the late developments in the printing press?

What grains are harvested by the reaping machine? What is the chief harvester company in the United States? What is the annual business in this machine?

Name the kinds of sewing machines you have seen. What work can the sewing machine accomplish?

With what work does the cream separator do away? In what enterprise is it particularly necessary?

If a man empties his purse into his head, no man can take it away from him. An investment in knowledge always pays the best interest. —*Franklin.*

Mathematics

In the general article *Mathematics,* besides the definitions of the several branches or divisions of the subject, there are references to separate articles upon each of these subjects. In each of these articles, *Arithmetic, Algebra, Geometry, Trigonometry, Analytical Geometry* and *Calculus,* the definition and description of the field covered is given, as well as a statement of the symbols used, the fundamental operation and, in the case of *Arithmetic,* the common course of study in schools.

The article *Mathematics* also refers to the article upon each of the important subjects of which mathematics treats, namely, *Number, Angle, Line, Plane* and *Solid.* Each of these articles contains definitions of the important classes which it includes or cross-references to separate articles upon these classes. For instance, the article *Number* includes a statement concerning complex numbers and prime and composite numbers and cross-references to *Infinity* and *Infinitesimal, Negative Quantity, Imaginary Quantity;* also to *Figurate Number* and to *Number, Methods of Teaching.* The article *Solid* contains cross-references to *Cone, Cube, Cylinder, Globe, Prism, Pyramid, Sphere, Tetrahedron.* Under *Line* there is a cross-reference to *Curves.* Under *Plane* there are cross-references to *Square, Circle, Triangle, Polygon* and *Ellipse.*

Among the special processes and principles described in separate articles are *Cancellation, Factor, Fractions, Mensuration, Power, Root, Progressions, Proportion, Function, Coördinates,* etc. A special article is given to NUMBER, METHODS OF TEACHING, and this is referred to from the article METHODS OF TEACHING and from the articles ARITHMETIC and NUMBER.

The department of weights and measures is centered in two general articles, one entitled *Weights and Measures,* the other called *Unit.* In the former the common system, or English system, of weights and measures is fully described, with the values of the various units, and a cross-reference is made to the article *Metric System,* which contains a complete account of the metric system, together with tables showing its relation to the English system. Reference is also made in this article to special articles on the various common units of measurement, and in each of these articles the system of which the unit forms the base is also described. In the article UNIT the units commonly used in the physical sciences are described, and reference is also made to the article WEIGHTS AND MEASURES, and to the articles on the various common units of measurement. This division of weights and measures includes also that of coin and money. In the article *Money,* besides a discussion of the theory of money from the standpoint of economics, a table is given showing the standard units of coinage in each of the important countries, and the value of these coins relative to the gold dollar of the United States. Reference is also made in this article to the article *Currency, Banks and Banking, Clearing House,*

Mint, and to the articles on each of the important standard coins. In each of these articles the value of the unit described relative to that of the gold dollar of the United States is given, and also the equivalent of the unit in the coins of other leading nations.

OUTLINE.

I. General Article.
   1. Classification and definitions of important branches.
   2. History.

II. Branches.
   1. Arithmetic.
   2. Algebra.
   3. Geometry.
   4. Trigonometry.
   5. Analytical Geometry.
   6. Calculus.

III. Subjects.
   1. Number.
      a. Definition.
      b. Classification.
   2. Angle.
   3. Solid.
   4. Line.
   5. Plane.

IV. Processes and Principles.

V. Methods.
   1. Number, Methods of Teaching.

VI. Weights and Measures.

QUESTIONS.

The science of mathematics was developed by what nation?

In what respect does mathematics differ from all other sciences?

In what manner has it aided investigation in other sciences—notably which?

What do we mean by an exact science?

What is the simplest branch of mathematics and the one in most common use?

Mention occupations where a knowledge of mathematics is required. Where only a knowledge of arithmetic is required.

In what professions based upon arithmetic are the methods undergoing constant improvement?

What does our twentieth century business college boast of along the line of up-to-date methods?

A mastery of arithmetic should secure what results?

Can it be said that a knowledge of number is inborn? What proof have we?

What is the value of arithmetic from a business standpoint?

What traits does it establish from a mental standpoint?

What is the practical use of algebra?

In what is it superior to arithmetic?

With what does it deal? Where is it used?

Of what does geometry treat? In what lines of business is it used?

Upon what does geometry reasoning depend?

Of the following, what knowledge of mathematics is necessary: Astronomy? Physics? Engineering? Carpentering? Architecture? Surveying? Banker? Bookkeeper? Ordinary citizen?

Money

I. Uses.
   1. Medium of Exchange.
   2. Measure of Value.
   3. Standard of Value.

II. Properties.
   1. Portability.
   2. Durability.
   3. Homogeneity.
   4. Divisibility.
   5. Stability.

III. Standard.
   1. In olden times.
   2. With semi-civilized.
   3. Gold.
   4. Silver.

IV. Currency.
   1. Gold certificate.
   2. Silver certificate.
   3. Treasury notes.
   4. United States notes.
   5. National bank notes.

V. Commercial Paper.
   1. Checks.
   2. Drafts.
   3. Notes.

VI. Study of Exchange.
   1. Domestic.
   2. Foreign.

QUESTIONS.

Should you find yourself in France with a $20 goldpiece, how many francs would you get in changing it?

How many marks would the Berlin banker give you for it?

How many yen would you receive for it from the banker of Tokyo? How many liang from the banker of Peking?

Why was not iron, lead, tin or copper adopted in place of gold and silver?

What is standard money? Token money? Bank money?

How many dollars of our money are necessary to equal the pound sterling of England?

What is the value of the Mexican dollar in the United States?

Correlated subjects: Currency, Banks and Banking, Clearing House, Mint, Credit, Tender.

Mint

I. Definition.

II. Ancient.
   1. Local officer controlled issuing of money.

III. Modern.
   1. Sovereigns of foreign countries hold exclusive right to issue money.
   2. United States government has exclusive right.
      a. Location of.
      b. Number.
      c. Director appointed by whom?

IV. Processes of Coining.

V. Assay Offices Also at Mint.

QUESTIONS.

When and where was the first mint established?

When and where was the first mint established in the United States? What was the first coin issued and in what year?

How many mints are there now in the country and where located? Can you see any reason for the location of one at Carson City?

Correlated subjects: Money—Coining.

The habit of simply reading to be entertained is a habit that no one can afford to form.

Medicine

It must be apparent to every wide-awake person that an elementary knowledge of the properties of medicine and related subjects is essential to one's comfort and well-being. The general articles on MEDICINE and SURGERY give an interesting and instructive history of the development and present-day state of perfection of these important sciences. Besides, throughout THE NEW PRACTICAL REFERENCE LIBRARY will be found scores of interesting articles covering very generally this important field of study. To know the adaptability and wholesomeness of the food we eat is essential to good health and no less important is it to know the common, accepted laws of exercise and sanitation.

We have particularly aimed to give a clear description of the symptoms and causes of the commoner diseases known to young people, such as SCARLET FEVER, DIPHTHERIA, MEASLES, and brief mention is made of the latest accepted and recognized method of treatment. We particularly wish to call the reader's attention to the splendid articles found on "ANTIDOTE," "GERM THEORY OF DISEASE," "BACTERIA," "SANITARY SCIENCE," "ATHLETICS," "APPENDICITIS," "FOOD," etc.

QUESTIONS.

Of what is medicine a science? With what does it deal?

DIVISIONS.
- Medicine proper.
- Surgery.

SUBDIVISIONS.
- Hygiene.
- Dietetics.
- Pathology.
- Nosology.
- Pathological anatomy.

THERAPEUTICS.
- a. General.
- b. Special.

SPECIAL DEPARTMENTS.
- Diseases of the skin.
- Diseases of the eye.
- Diseases of the nose.
- Diseases of the insane.
- Diseases of children.
- Military hygiene and science.

GENERAL CAUSES OF DISEASE.
- Germs.
- Resistance to healthy action.
- Breaking down of tissues, etc.

SYSTEMS OF TREATMENT.
- Early times.
  - a. Ceremonies.
  - b. Prayers.
- Vegetable treatment.
- Hydrotherapy.
- Osteopathy.
- Homeopathy.
- Allopathy.

What are the symptoms of diphtheria? Appendicitis? Scarlet fever? Measles? Smallpox?

What is vaccine? Antitoxin?

What distinguishes the physician from the surgeon?

What were the early beliefs as to the causes of disease and what the treatment?

What school of medicine upheld the bath as a panacea for all human ills?

What is homeopathy? Osteopathy? The germ theory of disease?

Is your family physician an allopath or homeopath?

If you do not know, by what means can you tell when he next has occasion to administer medicine to you?

What is an antidote? Are there poisons for which there are no antidotes? What antidotes will counteract the effects of the following poisons: Arsenic? Carbolic acid? Carbonic acid gas? Chloral? Coal Gas? Cocaine? Lye? Matches? Morphine? Nicotine? Opium? Paris green? Strychnine? Tansy? Turpentine, etc.?

We give below a limited number of closely related articles which will be found under their proper titles in the LIBRARY. The reader must constantly keep in mind that subjects should be looked for under their most natural heading; for instance, "Arsenic" would not be described under "Poison" or "Medicine," but under its own title:

Homeopathy
Dispensary
Health, Boards of
Medicine
Hygiene
Nurse
Inoculation
Antidote
Diphtheria
Smallpox
Mumps
Food
Cancer
Athletics
Chloroform
Ether
Osteopathy
Ambulance
Sanitary Science
Anatomy
Histology
Apothecary
Antitoxin
Germ Theory of Disease
Appendicitis
Scarlet Fever
Bandage
Poison
Gymnastics
Influenza
Adulteration
Mosquito, Transmission of Disease
Hospital
Insane Asylum
Disease
Physiology
Surgery
Vaccination
Hydrotherapy
Dietetics
Consumption
Measles
Allopathy
Yellow Fever
Typhoid Fever

If a genius like Gladstone carried through life a book in his pocket, lest an unexpected spare moment slip from his grasp, what should we of common abilities not resort to to save the precious moments from oblivion?

Believe me when I tell you that thrift of time will repay you in after life with a usury of profit beyond your most sanguine dreams, and that waste of it will make you dwindle alike in intellectual and moral stature beyond your darkest reckoning. —*Gladstone.*

A true American sentiment recognizes the dignity of labor and the fact that honor lies in honest toil. —*Cleveland.*

Military and Naval

In the general articles ARMY and NAVY will be found a history of the armies and navies of all the leading nations of the world. All important wars, such as the RUSSO-JAPANESE, the SPANISH-AMERICAN, etc., are described under their respective headings. All noted battles and naval engagements, such as the BATTLE OF ANTIETAM, the BATTLE OF MANILA BAY, are described in articles to themselves, accompanied by helpful outline maps. Besides all correlated subjects are generously treated, such as NAVAL ACADEMY, MILITARY ACADEMY, NAVY, DEPARTMENT OF, ARMS AND ARMOR, ARMOR PLATE, CANNON, MUSKET, RIFLE, MILITARY SCIENCE, WARSHIPS, MILITIA, TORPEDO, SUBMARINE BOAT, TACTICS, etc. Biographies of all the leading military and naval commanders will be found throughout the work.

ARMY.

ANCIENT ARMIES.

When and where did the first military organization flourish? Who was its founder?

Who was Xerxes? Describe his invasion of Greece, and the naval battle at Salamis. How does this naval battle rank?

What army vanquished the Greek forces and excelled in spirit and discipline?

MEDIEVAL ARMIES.

What caused the disruption of the national armies of this period?

What is said of the battles of this period? What combats were common to this time?

MODERN ARMIES.

What recent wars have brought great improvements? Name three and give several improvements resulting from each.

What was the length of the battle line in the battle of Mukden? How was this made possible?

What is an intrenchment? A skirmish?

In what way are automobiles useful? Balloons? Searchlights? Range-finders? Explosives?

To what degree of perfection was sanitary science carried in the Russo-Japanese War? What was the loss in killed and wounded on each side?

UNITED STATES ARMY.

How does the size of the army of the United States compare with other leading countries?

What requirements would you have to possess and fulfill to become eligible for an appointment to West Point?

From what time does our military history date?

How many men were engaged by the Colonies in the Revolutionary War?

What was the enrollment of the regular army in 1790? In 1861?

For how many volunteers did Lincoln call in April, 1861, and for what time? What was the total number enrolled during the war?

How many men were raised by the southern states?

By the army reorganization bill of 1901, what is now the size of the standing army?

Into how many departments is our army divided? Within the limits of what department do you reside? Who is the commander?

Granting that every fifth person in the United States is liable to military service, what would be the number of men of such an army?

Is military service obligatory in Russia? In Germany? Japan? Why not in the United States?

What is the size of the British army? The French? The German? The Japanese? The Russian?

Great Battles.

Name ten and tell what side was victorious, and give the number of killed, wounded or captured.

Great Generals.

Make a list of ten, naming the principal battles in which engaged and characteristics of each.

NAVY.

General.

What is a knot? How does it compare in length with a mile?

When were commercial ships safe in olden times?

What do you understand by merchant marine?

Why have wooden war vessels been abandoned?

What are the comparative sizes of the navies of the following countries: Great Britain, Germany, Japan, United States, France, Italy, Russia?

What South American country holds first rank?

United States.

Who is commander in chief of our navy?

When was the Naval Academy established? Where is it located? What are the requirements for admission? What is done from June to September? How many cadets are allowed for each senator? For each representative?

How many men are now engaged in the American navy?

What is the cost of the navy yearly?

How many first-class battleships were in the navy in 1911? How many torpedo boats?

Going at thirty knots per hour, how long would it require a torpedo boat to cross the Atlantic, from New York to Liverpool? Would it outrun a freight train running at usual speed?

What was the cost of the Dreadnaught, one of the largest warships afloat? (See Warships.)

Describe the battle of Manila. Who commanded the American fleet? How many ships were sunk?

Who invented the Monitor?

What is a torpedo boat? A submarine boat?

Great Naval Battles.

Make a list of ten of the most noted naval battles in the world's history, in what waters they occurred, and the results.

Naval Heroes.

Name five great American and five great foreign naval commanders and tell something of interest of each.

You cannot dream yourself into a character;
you must hammer and forge yourself one.
—*Froude.*

Mythology

"Mythology, the collective name given to the body of fables, legends or myths which grew up in almost all primitive nations regarding the creation of the world, the origin of man, the powers of nature and the adventures of the gods and heroes. It is natural that in the savage mind such questions should arise as:

What is the world?
What is man?
Who made them?
Whence came all the natural objects about us?
What causes the changes from light to darkness, from heat to cold, from life to death?"

You have been interested in the above paragraph and might be further interested to know that it is but a part of the first paragraph given in our article on Mythology. If so, your interest will be augmented in knowing that we give a complete discussion of the Origin of Mythology, Grecian and Roman Mythology, Scandinavian Mythology and Egyptian Mythology.

This discussion will prepare us for still further examination of the subject and we append a partial list of correlated subjects included under "A" in The New Practical Reference Library. This work can be continued throughout the alphabet and the material all classified under their respective countries:

Achates, Acheron, Achilles, Actæon, Adonis, Ægis, Æneas, Æolus, Æsculapius, Agamemnon, Aganippe, Ajax, Albion, Alcestis, Ammon, Amphion, Andromache, Andromeda, Antæus, Antigone, Apollo, Argonauts, Argus, Ariadne, Atalanta, Atlas, Augeas, Aurora.

OUTLINE.

I. General Meaning.
II. Divisions.
    1. Myths of explanation to questions asked by primitive man in regard to creation.
        a. What am I?
        b. Whence did I come?
        c. What is the world?
        d. Whence came all nature?
        e. Causes of light, darkness, life and death, etc.
    2. Myths of entertainment.
        a. Tales of adventure of gods and heroes.
III. Origin and Theories.
    1. Gods were mere men remembered after death by their great deeds.

2. Wise men invented them for the purpose of establishing law, through the gods appealing to mankind.
3. Inventions of poets, story-tellers, etc.
4. Myths explained all physical phenomena.

IV. Grecian and Roman.
1. Creation of all things explained by myths.
2. Planets as rulers of universe.
3. Universe divided and rulers take different abodes.
4. Abode of lesser deities.

V. Scandinavian and Northern Mythology.
1. Explanation of creation.
2. Giant Ymir first created.
3. Bori, father of all gods, appears.
4. Earth then formed from Ymir by Bori's grandsons.
5. Twelve gods and twenty-four goddesses.
6. Gods beneficent and kind.

VI. Egyptian.
1. Many religious myths; not universal as in others.
2. The stronger eventually led.
3. Distinctive belief, soul of man was immortal.

VII. Comparison of Different Myths.
1. Points of resemblance.
2. Points of difference.
3. Underlying principle same throughout.

QUESTIONS.

What great literary masterpieces are founded on Greek mythology?

What great benefits have accrued to the modern world on account of mythology?

The founding of what city famed in history is based on mythology?

Who was Achilles? Give the story of Hercules.

What was the foundation of mythology? What is its substitute in modern days?

What marked the decline of mythology? What effect would authentic history have upon it?

How does a people outgrow its mythology?

Which are the best-known mythologists?

What are the three systems of interpreting the origin of myths?

Of what monsters was Uranus the father? Who was his wife?

Which of the Titans dethroned his father and what was the ultimate fate of all twelve?

Who dethroned Cronus and became ruler of the world?

What Greek god was identified with the Roman Jupiter?

What was the ancient conception of Jupiter?

Who was next in rank to Jupiter?

What temple on the Capitoline was erected to Juno?

What was the peculiar relation of Mars to the Romans? How is he represented in art?

Who were the parents of Apollo? What did he mean to the Greeks and Romans?

With whom did Diana come to be identified?

What are the varying accounts of the parentage of Venus?

What famous statue and painting represent Venus as issuing from the sea foam?

Who was Mercury's mother? Over what did the god preside?

Who were Vesta and the vestal virgins?

What was the original number of muses?

Who was the muse of comedy?

What goddesses in northern mythology corresponded to the Greek fates?

What did Nemesis personify?

What was the ancient conception of the earth?

What animals were sacrificed to Ceres?

Who were the children of Ceres?

Who has made the Satyr celebrated in art?

What was the Greek hades?

What is a common representation of Neptune?

What expedient did Ulysses use by which he and his crew escaped the Sirens?

What terrible fate befell all those who looked upon the Gorgons?

Into what inanimate object did Zeus change Niobe?

What was Acteon's harsh fate?

In what way was Diana associated with Endymion?

Of what was Psyche a beautiful personification?

Why was Orpheus an important figure in Greek mythology?

Of what was the beautiful Aurora goddess?

What is the interesting vocal Memnon?

In what miraculous way did Perseus escape an early death?

Through whose aid did Jason secure the Golden Fleece?

What famous riddle did Œdipus solve?

Who was the bravest hero of the Trojans killed by Achilles?

What oath were the suitors of Helen compelled to take?

Osiris, representing all that is good, was opposed by what god who was a personification of evil?

Who was Dagon?

From what form of Odin's name is Wednesday derived?

How did Odin inform himself of what took place on earth?

According to Norse mythology which was the first of all things to come to life?

Who was Thor?

What is a vampire?

How is our word tantalize naturally derived from Tantalus?

Correlated subjects: Balder, Freya, Frigga, Lok, Odin, Thor, Tyr, Hercules, Minerva, etc.

The habit of laying up in the memory what has not been digested by the understanding is at once the cause and the effect of mental weakness. —*Sir W. Hamilton.*

Next to acquiring good friends, the best acquisition is that of good books. —*Colton.*

Nature Study

There is no subject of greater interest to pupils than the great world of nature, and that teachers may be able to present this subject in a comprehensive way we have arranged this series of lessons. There is no other means of giving pupils so much useful knowledge as to guide them through nature's storehouse.

As directed in your course of study, correlate the various subjects with nature study so that each may help to a proper understanding and appreciation of the other. Do not fail to make every lesson a lesson in LANGUAGE, a lesson in SPELLING, a lesson in PENMANSHIP, and incidentally connect the NUMBER WORK and READING WORK with it all.

MINERALS.

Iron—Discovery, where found, kinds, composition, uses, history, iron-working.
Lead—Production in United States, uses, manner of preparing.
Coal—Classify, anthracite, bituminous, cannel, uses, where found, coke.
Copper—Early uses, nature of, many uses, where found, quantity used.
Gold—Uses: (a) necessities, (b) luxuries; gold beating, gold mining, quartz
Silver—Five kinds, uses, smelting, eliquation of, amount produced.
Aluminum—Discovery, process of making, nature of, uses.
General topics—Blast furnace, assaying, amalgam.

ANIMALS.

Extinct—Mammoth, mastodon, megatherium, pterodactyl.
Fabled—Chimæra, dragon, griffin, phœnix, mermaid.
Domestic—Camel, dog, cat, cow, horse.
Sea—Whale, seal, walrus, dolphin, coral.
Insects—Fly, mosquito, flea, ant, gnat, butterfly, beetle.
Fowls—Duck, goose, guinea, pigeon, turkey, poultry.
Birds—Jay, robin, carrier pigeon, stork, condor.
Miscellaneous—Prairie dog, frog, dodo, chameleon, monkey.

PLANTS.

Fungi—Lichens, mushrooms.
Flowers—Dahlia, geranium, phlox, hollyhock.
Vegetables—Potato, onion, radish, bean, lettuce.
Cereals—Wheat, corn, rye, oats, barley.
Fibers—Hemp, flax, cotton, jute.
Fruit—Orange, lemon, olive, palm, almond, bread fruit.
Forest trees—Pine, mahogany, rosewood, cinchona.
Miscellaneous—Bamboo, tea, coffee, seeds, weeds.

MISCELLANEOUS. (Classify.)

Termites, infusoria, oyster, cork, salmon, orchid, mica, mimicry, mineral work.

Birds

- BIRDS
  - General Description
    - Frame
    - Covering
    - Flight
    - Endurance
    - Sight
    - Song
    - Usefulness
  - Classification
    - 1. Birds of Prey
      - Eagle
      - Hawk
      - Owl
    - 2. Perchers
      - Canary
      - Robin
      - Wren
    - 3. Climbers
      - Parrot
      - Woodpecker
    - 4. Scratchers
      - Fowl
      - Pheasant
      - Pigeon
    - 5. Runners
      - Ostrich
      - Emu
    - 6. Waders
      - Snipe
      - Sandpiper
      - Crane
    - 7. Swimmers
      - Duck
      - Goose
      - Gulls
  - Subjects relating to birds
    - Eggs
      - Size
      - Color
      - Shape
    - Nests
      - Shape
      - Materials
    - Feathers
      - Quills
      - Plumes
    - Food
      - Bugs
      - Insects
      - Worms, etc.
      - Grains
    - Migration
      - 1
      - 2

A GREEDY BIRD.

The condor, the great vulture of the Andes of South America, has a voracity so great that it often gorges itself to such an extent that it cannot fly. It has been known to eat eighteen pounds of meat in a day.

LAUGHING BIRDS.

In the Zoölogical Garden of Melbourne, Australia, are strange-looking birds resembling small owls with donkey-like faces. These birds are called laughing jackasses. They perch together in rows and look as if they were very much amused over something. Presently one of them says "Ha," which is repeated by the others until the entire row seems perfectly convulsed with laughter, and people standing by laugh with the birds until the tears run down their cheeks, and they are doubled up by their paroxysms. These birds will not laugh to order. Sometimes they refuse to laugh at all for an entire day.

—*Morton.*

TEST QUESTIONS ON BIRDS.

Have birds any teeth? Any ears? How is their food digested?

Are some birds provided with a complete suit of feathers when hatched?

Name three striking characteristics distinguishing birds from other animals?

Flying at the rate of 50 miles an hour how long would it take a duck to travel from Lake Superior to the Gulf of Mexico?

Can the birds that flit from bush to bush cover long distances in a single flight?

Why do some of the bones contain air cavities?

Is there anything unsual about their sense of sight?

Why does not the perching bird fall when asleep?

Do birds return to the same neighborhood and frequently to the same nest, year after year?

Can the female sing?

Are the best singers the large, brilliant birds, or the small, lively ones?

How do birds greatly benefit the farmer and fruit grower?

Name 20 species common to your neighborhood?

NESTS.

What bird uses the nest of another in which to lay its eggs? Is this imposition resented and how?

Are some eggs laid and hatched by the heat of the sun or vegetable matter surrounding them?

Will the wild turkey leave its nest before the eggs have been skilfully covered?

What bird lives in the home of the prairie dog?

What is peculiar about the kingfisher's nests?

Describe them?

How do the tailor birds make their nest and why called "tailor birds"?

What materials do the birds in your neighborhood use in the building of their nests?

EGGS.

How does the young chick get air while and before hatching?

Why are some eggs round?

In what kind of nests are such eggs laid?

Which end of an egg is the more highly colored?

What is the shape of eggs, such as the hen's, laid on the ground? How does this shape protect the egg from blowing away?

Where are the eggs of sea birds gathered and used for food?

Ask your family doctor which contains the greater amount of nourishment, an egg or a pound of steak?

Eagle

"The King of Birds."

- Classification.
  - Golden Eagle.
    - Where found?
    - Size.
    - Appearance.
  - Bald Eagle.
    - Home.
    - Characteristics.
    - Description.
  - Harpy.
    - Where found?
    - Plumage.
    - Strength.
    - Fierceness.
  - Lammergeier.
    - Characteristics.
    - Home.
    - Appearance.
- Description.
  - Head.
    - Appearance.
    - Eyes.
  - Bill.
    - Shape.
    - Strength.
    - Length.
  - Wings.
    - Size.
    - Strength.
    - Color.
  - Feet.
    - Number of toes.
    - Use.
    - Strength.
- Characteristics.
  - Great flight.
  - Thievishness.
  - Birds of prey.
- Nests.
  - Mountain tops.
  - High trees
  - Cliffs.
- Food.
  - Capture.
  - Small animals.
  - Fish.
  - Dead meat.
- History.
  - Military Emblems.
    - Persian Spears.
    - Roman Standard.
    - United States.
    - Russia.
    - France.
    - Prussia.
    - Austria.
  - Legendary.
    - Messenger of Jove.
  - Symbol of—
    - Fortitude.
    - Power.
    - Courage.
    - Nobility.

QUESTIONS ON EAGLES.

For what does the eagle stand?

How did the ancient Greeks regard the eagle?

What countries now use it as a national ensign?

Are the eagle's habits as noble as its appearance?

What eagle is the national emblem of the U. S.? When was it adopted?

What trait is peculiar to the Bald eagle?

Describe the Golden eagle. In what countries is it found?

On what does the eagle live?

What eagle is noted for its size and fierceness? For what are its feathers used?

In what countries is the Lammergeier found? On what does it live?

What is the value of a gold eagle of the U. S.? When was the first one coined?

When did the eagle first appear as a military standard?

When was it adopted by the Romans?

How is the eagle of Russia distinguished from that of the U. S.?

Robin

EUROPEAN.
- Size.
- Habits.
- Song.
- Where found?

AMERICAN.
- Size.
- Sociability.
- Song.

DESCRIPTION.
- How classified?
- Appearance.
- Plumage.
- Special Feature.

FOOD.
- Worms.
- Insects.
- Cherries.
- Small Fruit.

NESTS.
- Where found?
- Strength.
- Size.
- Structure.

EGGS.
- Number.
- Size.
- Color.

QUESTIONS.

Have robins any teeth? How do they handle their food?

How does the robin breathe?

What is a popular name for this bird? Why is it appropriate?

To what class of birds does the robin belong?

What is peculiar about the formation of the muscles in the legs of perching birds? Of what use is this?

When does the robin first appear in the spring?

Name two ways in which the American and European robins differ.

What characteristics make this bird a favorite?

What class of people do not favor the robin? Why?

When do the robins migrate? Why do they do this?

How many eggs are usually laid? What is their general appearance and shape?

Parrots

SPECIES.
- Number.

DESCRIPTION.
- Bills.
  - Shape.
  - Uses.
- Tongues.
  - Description.
  - Peculiarity.
- Plumage.
  - Wings.
  - Tail.
  - Colors.
- Legs.
  - Strength.
  - Shape.
- Toes.
  - Number.
  - Arrangement.

HABITATION.
- Countries.
- Nests.

FOOD.
- Fruits.
- Seeds.
- Roots.
- Insects.
- Honey.

KINDS.
- Green Parrot.
  - Where found?
  - Appearance.
  - Favorite pet.
  - Accomplishment.
- Love-bird.
  - Size.
  - Description.
  - Peculiarity.
  - Where found?
- Macaw.
  - Size.
  - Plumage.

Characteristics.
Where found?
Cockatoo.
Homes.
Plumage.
Crests.
Easily tamed.
Parakeets.
Size.
Feathers.
Colors.
Intelligent.
Where found?
Lory.
Kinds.
Tongue.
Plumage.

QUESTIONS ON PARROTS.

How many species of parrots are found?
Name the six most important classes.
How does the tongue of a parrot differ from that of other birds?
What three things assist the parrot in climbing?
Where is their favorite meeting place?
On what do they live?
What particular species is the most popular in the U. S. for pets? Why?
For what are love-birds noted?
In what countries are Parakeets found? When did they find their way into the U. S.?
What are the characteristics of the Macaws? For what are they prized?
What is peculiar about the tongue of a Lory? How is it useful?
In what way do Cockatoos differ from other parrots? Where is their home?

Pigeon

Species.
Number.
Classification.
Wild.
Gouras.
Passenger.
Mourning Doves.
Turtledoves.
Domestic.
Fantail.
Carrier.
Homing.
Pouter.
Jacobin.
Tumbler.
Description.
Size.
Color.
How distinguished?
Characteristics.
Flight.
Speed.
Endurance.
Instinct.
Nests.
Structure.
Size.
Where built?
Eggs.
History.
Where found?
Numbers.
Usefulness.
Extermination.

QUESTIONS.

Into what two classes are pigeons divided?
What is the difference in appearance between the pigeons found in temperate climates and those found in the tropical climates?
Where is the largest species of wild pigeon found? Describe their plumage.
Name two classes of wild pigeons found in the United States.
Tell what you can of the passenger pigeon.
Name two characteristics of turtledoves.
Name four species of domestic pigeons and tell why their names are appropriate.

Describe the carrier pigeon. For what has it been used?

What is a peculiarity of the homing pigeon? How far can it fly without stopping?

What are young pigeons called? For what are they used?

What is the character of pigeons' nests? How many eggs are usually hatched at one time?

Ostrich

DESCRIPTION.
- Size
- Height
- Weight
- Feathers
  - (a) Of male
  - (b) Of female
- Head
- Eyes
- Beak
- Wings
- Color
  - (a) Of male
  - (b) Of female
  - (c) Of chicks

CHARACTERISTICS.
- Food
- Wild state
- Domesticated
- Speed
- Eggs
  - (a) Where laid
  - (b) How hatched
  - (c) Number

OSTRICH FARMS.
- California
- Arizona
- South Africa

TEST QUESTIONS ON OSTRICH.

How does the weight and height of a full-grown ostrich compare with the weight and height of an average-sized man?

Of what country is the ostrich a native?

Are the wings of any use to the bird?

How fast can the ostrich run? Could it outrun a fleet horse?

What is the color of the feathers of the male? Female?

How are the eggs hatched in warm countries?

Does the male aid in hatching the eggs?

At what age do the birds attain their full growth?

Crane

SPECIES.
- Waders.

CLASSIFICATION.
- Whooping.
- Sand-Bill.
- Demoiselle
- Sacred.

DESCRIPTION.
- Size.
- Structure.
  - Neck.
  - Legs.
  - Windpipe.
  - Feathers.

HOMES.
- Countries.
  - Japan.
  - India.
  - Central Asia.
  - Africa.
  - United States.

NESTS.
- Bushes.
- Marshes.

EGGS.
- Number.
- Appearance.

HABITS.
- Migration.
- Feeding Time.
- Dozing.
- Peculiar Position.

CHARACTERISTICS.
- Domestication.
- Peculiar Dances.

Courtships.
Graceful Antics.

FOOD.
Vegetable matter.
Insects.
Worms
Frogs.
Reptiles.
Small Fish.

QUESTIONS.

Name two ways in which the Crane is remarkable.

In what countries is it regarded as sacred?

For what is the Demoiselle Crane noted? In what countries is it found?

How many species are found in the United States? Which is the largest and most important?

Why is the Whooping Crane so called? Describe the construction of its windpipe.

What is peculiar about the antics of this bird? At what time is it most noticeable?

On what kind of land are these birds usually found? Why is this land particularly suited to the Crane?

Where do the Cranes spend their summers? Where do they go in the fall?

What is peculiar about the way they spend the day? Describe their position when dozing.

What country gives the Crane a prominent place in its art?

Ducks

WILD.
Mallard.
Distinctive appearance.
Original of Domestic Duck.
Plumage.
Tail feathers.
Canvasback.
Where found?
Value.
Appearance.
Shoveler.
Formation of bill.
Feeding place.
Appearance.
Gadwall.
Size.
Where found?
Appearance.
Value.
Woodduck.
Beauty.
Migration.
Eider Duck.
Size.
Appearance.
Value.
Habits.

DOMESTIC.
Favorite Kinds.
Normandy.
Picardy.
Aylesbury.
Musk Duck.
Size.
Comparative.
Largest variety.
Appearance.
Variety.
Plumage.
Tail feathers.
Formation of feet.
Characteristics
Habits.
Of young.
Food.
Animal.
Vegetable.
Use.
Food.
Feathers.
Down.

QUESTIONS.

Into what two classes are ducks divided? Why are they so named?

From what did the domestic duck originate? How does its plumage differ from that of the wild duck?

How does the plumage of the Mallard differ from that of the Gadwall? For what are both these ducks prized?

What varieties of domestic ducks come from France? From England?

For what are the Musk ducks noted? What is their native country?

Name six varieties of wild ducks and tell one way in which each is noted.

In what countries does the Eider duck abound? How is it protected?

How are the nests of the Eider ducks constructed? Where is the down obtained?

Name two ways in which Eider ducks are used.

How much down does the female Eider duck furnish? How much is sufficient for a bed? How many ducks will it take to furnish down sufficient for a bed?

What is unusual about the migration of the woodduck?

Describe the formation of the wings of a duck. How does this assist it in flying?

Spiders

DESCRIPTION.
- Head and chest.
  - Formation.
  - Description.
- Abdomen.
  - Glands.
  - Filaments.
    - Use.
    - Appearance.
- Legs.
  - Number.
  - Description.
- Mandibles.
  - Glands.
  - Fluid.
  - Kill prey.

CHARACTERISTICS.
- Fighters.
- Runners.
- Leapers.
- Swimmers.

EGGS.
- Number.
- Where hidden.
- Where hatched.

SPECIES.
- Tropical.
- Garden.
- Water.
- Tarantulas.
- Trap Door.

HABITATION.
- Webs.
  - Shape.
  - Catch prey.
  - Serve as houses.
- Water Nests.
  - Construction.
  - How suspended.
  - Appearance.
- Underground Nests.
  - Size.
  - Shape.
  - Lining.
  - Construction

FOOD.
- Flies.
- Birds.
- Small insects.

QUESTIONS ON THE SPIDER.

Is the spider an insect?

Name five common varieties.

Describe the formation of the head and chest.

How many glands or spinnerets has a spider? For what are they used?

What name is the nest or home of the spider called? For what is it intended?

By what means does the spider kill its prey?

How does the female spider compare in size and fierceness with the male?
What tends to make her appear larger than she really is?
Describe the manner in which the spider captures its food.
Where is the home of the water spider? How is it constructed?
From what did the Trapdoor spider get its name? Of what does this trapdoor consist?
What is the shape and size of these underground nests? How are they lined?
To what country does the real tarantula belong?
What means are used to cure the bite of a tarantula?
What curious fact is known about the spider when its limbs are torn off?

fly

- Species.
  - Number.
  - Characteristics.
  - Why hard to study?
- Description.
  - Wings.
    - Number.
    - Color.
    - Balancers.
  - Head.
    - Description.
    - Eyes.
  - Feet.
    - Formation.
    - Advantages.
- Habitation.
  - Where found?
  - Countries.
- Eggs.
  - Number.
  - Incubation.
  - Development.
- Food.
  - Kinds.
- Harmfulness.
  - Annoyance.
  - Spread disease.

QUESTIONS.

How are flies characterized?
What is peculiar about their eyes?
What makes the study of the fly difficult?
For what are the balancers used? Where are they situated?
What is the commonest species? Where is it found?
Give two reasons why the common fly is undesirable.
How does the formation of its feet aid it in climbing?
In what countries does religion prevent the people from killing flies? What is the result?
How many species of flies are said to exist?
Name four other insects which belong to the same family.
Do any flies live through the winter?
Name some of the different kinds you have seen.

Squirrels

The *Rodentia*, or *Rodents*, commonly called *Gnawers*, comprises one of the largest orders in the animal kingdom. In size the rodents vary from those having a length of three feet to the smallest mouse. Certain species, as guinea pigs and white varieties of rats and mice, are sometimes kept for pets, but most of them live in the wild state. The squirrel family is one of the most interesting of the twenty families belonging to this order. It is divided into two groups, or subfamilies, the squirrels proper and the marmots.

OUTLINE.

SQUIRRELS.

I. Tree Squirrels.
   1. Species.
      (a) Red.
      (b) Gray.
      (c) Fox.
      (d) Black.
      (e) Flying.
      (f) Oriental.
   2. Characteristics.
      (a) Bushy tails.
      (b) Sharp front teeth.
      (c) Strong jaws.
      (d) Large bright eyes.
      (e) Slender, graceful body.
   3. Nests.
      (a) Hollow trees or logs.
      (b) Tops of trees, old buildings, etc.
      (c) Made of wood fiber, leaves, moss, etc.
   4. Young.
   5. Food.
      (a) Kinds: Nuts, corn, acorns, etc.
      (b) Where stored.
      (c) Manner of eating.
   6. Uses.
      (a) Fur.
      (b) Food.
   7. Damage.
      (a) Destroy crops.
      (b) Eat birds' nests.

II. Ground Squirrels.
   In the United States the Chipmunk only.

MARMOTS.

1. Species.
   (a) Marmot.
   (b) Gopher.
   (c) Prairie dog.
   (d) Woodchuck.
2. Characteristics.
   (a) Large head.
   (b) Strong teeth.
   (c) Cheek pouches.
   (d) Short tail.
   (e) Short stout body.
3. Habits.
   (a) Burrow in ground.
   (b) Some species live in villages.

QUESTIONS ON SQUIRRELS.

Into what groups is the squirrel family divided?
In what countries are they found? Where commonest?
What is remarkable about the structure of the flying squirrel? Describe its flight.
What effect do the changing seasons have on the color of the squirrel?
Name five species of tree squirrels found in America.
For what is the Oriental squirrel remarkable?
Of what does their food consist? How is it obtained?
Describe their manner of eating.
Of what commercial value are they?
Name six species classified under ground squirrels.
What are the characteristics of each?
Of what use are the cheek pouches?
In what way are some ground squirrels undesirable?
Name three ways in which ground and tree squirrels differ.

Rabbits

CLASSIFICATION.
- Hares.
  - American.
  - Mountain.
  - Polar.
  - Prairie.
  - Belgian.
- Rabbits.
  - Cottontail.
  - Jackrabbit.
  - Gray.
  - White.

DESCRIPTION.
- Domestic.
- Wild.
- Comparative size.
- Ears.
- Limbs.
- Color.
- Changes.

CHARACTERISTICS.
- Timidity.
- Sight.
- Hearing.
- Fleetness.
- Voice.

HABITATION.
- Where found.
- Kinds of nests.
- How distinguished.
- Young.

FOOD.
- Grass.
- Bark.
- Herbs.
- Vegetables.

USES.
- Food.
- Fur.
- Skin.

QUESTIONS.

In what way is the hare distinguished from the rabbit?
What class of hares change color in winter? Do you think this change is any protection? Why?
How is the rabbit protected from its enemies?
How does the rabbit compare in size with the hare?
What change in appearance takes place when tamed?
How do they become a menace?
Why is the jackrabbit so called?
What does the voice of a rabbit resemble? When is it heard?
What is an Albino rabbit?
In what way is the skin used? Is the fur valuable?
How does the formation of its hind legs affect its movements?
In what countries are rabbits found?
In what country did they become a pest?

Water

I. Composition.
  - Elements.
  - Proportion.

II. Source.
  - Clouds.
  - Ocean.
  - Lakes.
  - Rivers.
  - Springs.
  - Wells.

III. Forms.
  - Effect of temperature.
  - Solid.
    - Ice.
    - Snow.
    - Hail.
  - Liquid.
    - Rain.
  - Gaseous
    - Vapor.
    - Steam.

IV. Kinds.
  - Rainwater.
  - Hard.
  - Soft.
  - Distilled.
  - Mineral.
  - Salt.

V. Properties.
  - Density.
  - Solvency.
  - Gravity.
  - Purity.
  - Weight.
  - Expansion.

VI. Characteristics.
  - Color.
  - Taste.
  - Odor.
  - Refraction.
  - Conduction.

VII. Uses.
  - Drinking.
  - Cooking.
  - Bathing.
  - Cleaning.
  - Transportation.
  - Operates machinery.

QUESTIONS

Of what is water composed? How is its formula written?

What change takes place in its color when viewed in mass?

What do you know of its powers of conduction and refraction?

At what temperature does water take the solid form? Liquid? Vapor or steam?

For what is water considered the unit? Why?

What is the weight of a cubic inch of water? When is it at its greatest density?

What is peculiar about the expansion of water?

On what property depends the universal use of water? What is a consequence?

Why is soft water so called? Hard? For what is each especially adapted?

How is pure water obtained?

What are the great natural reservoirs?

Describe the process by which moisture is gathered by the clouds. What does this result in?

What two things are absolutely necessary to human life?

Why should care be taken to keep water pure?

Outline on Coffee

- COFFEE
  - Appearance of plant.....
    - Leaves..... Surface, Color
    - Blossoms..... Fragrance, Color, Shape
    - Fruit ..... Size, Color, Cells
  - Cultivation.....
    - Countries ..... Ceylon, Java, Brazil, Mexico, Central America, West Indies, Arabia
    - Conditions .... Heat, Moisture, Shade

TEST QUESTIONS ON COFFEE.

What is the height of the coffee tree? How would it compare in size with the plum tree?

What is the average number of pounds of coffee per tree from each crop?

What country supplies two-thirds of all the coffee used?

Where does the best coffee come from and what is it called?

Describe the leaves, the blossoms, the fruit?

How are the berries gathered? How dried? How is the husk removed? How is coffee packed for shipment?

Of what countries is it a native?

Who were the first people to extend the cultivation to other countries?

What conditions are necessary to the growth of the plants?

Why is great skill and attention necessary in the roasting?

From what country does the United States get most of her coffee?

What is the color of the berry before roasted?

How many trees, with coffee selling at wholesale at ten cents per pound, would it require to make the same amount of money as derived from an apple tree producing ten bushels of apples valued at twenty-five cents per bushel?

Tea

I. DESCRIPTION.

1. Shrub.
   a. Height.
      When native.
      When cultivated.
2. Leaves. (See color plate.)
   a. Color.
   b. Size.
3. Flowers. (See color plate.)

II. Cultivation.
1. Where grown?
2. How many crops yearly?
3. Harvesting leaves.
a. Picking.
b. Drying.
c. Rolling.
d. Packing.

III. Grades.
1. Green tea. How prepared?
2. Black tea. How prepared?
3. Cheap grades. How prepared?
4. Commercial brands.

IV. Food Values.
1. Beverage.
a. What effect on system?
2. Extent of use.

V. Use as an Antidote.

QUESTIONS.

Why is the shrub under cultivation made to branch freely?
What part of the shrub is of commercial value?
How are green and black teas prepared?
Which of the annual harvests yields the best grade?
In what countries is tea cultivated?
May all grades and varieties of teas be prepared from the same plant?
Examine a tea leaf after steeping and compare it with those in the plate shown. Examine a number after steeping and compare them in size with each other.
In what kind of cases is tea packed? Why?
Look at the color plate and point out the parts of the plant.
What is the effect of excessive tea drinking? Is it beneficial in mild quantities? Why? Is it a stimulant?
How are some grades of green tea given their color?
Name some of the brands of tea sold in your town.

Sponge

I. Description.
1. Animal.
a. Resembles what substance?
b. Sponge of commerce. What?
c. Tubes or openings.
Use?
How located?
Number?
Extend where?
Lined with what?
d. Stomachs. What? Where?
e. Food. What? How obtained?
f. Appearance.
Glass-like. Why?
Glass-rope. Why called?
Venus Flower Basket. Why?

II. Species.

III. Properties—Sponge of commerce.
1. Light.
2. Tough.
3. Elastic.
4. Porous.
5. Absorbent.
6. Soft.

IV. Home.
1. Mediterranean Sea.
2. Red Sea.
3. How far below surface?

V. Means of Securing.
1. Diving.
a. Ancient.
b. Recent.

2. Spears and prongs.
    a. Method of seeing below water.

VI. Preparation for Market.
1. Decomposition of what?
2. Cleaned.
    a. Beaten. Why?
3. Dried.
4. Markets. Where sent?

VII. Uses.
1. Bathing.
2. Hospital.
3. Medical.
4. Domestic.

QUESTIONS

What part of the sponge produces the egg?
What do we mean by a marine animal?
Do sponges attach themselves to a support?
What purpose do the openings serve?
Of what aid to the sponge are the currents of water?
Does any one tube extend entirely through the body?
By your own experimenting, prove that a sponge is light, tough, elastic, porous, absorbent, soft, etc.
Why may sponges become a source of disease? What is the danger in cheap sponges?
What is known as the fresh-water sponge? What are its habits?
Give in detail the methods of gathering sponges.
To what order of animals do sponges belong?
What are the general characteristics of this order?
What other animals in this order? In what do they resemble the sponge?
What is the food of the sponge and how obtained?
What is their digestive apparatus?
What are the domestic uses of sponges?
Of what use are they in the medical profession?

Bats

I. General Description.
1. Size.
2. Construction of wings.
3. Skin.
4. Eyes.
5. Nocturnal animal.
6. Habits.
7. Food.
8. Home.

II. Classes.
1. Flesh-eating—Vampire bats and common kinds.
2. Fruit-eating.
3. Species—brown, heavy, big-eared, leaf-nosed.

III. Where Found.

QUESTIONS.

What kinds are common to your vicinity? Where do they live? What do they eat?
Where and how do bats hibernate?

Where are the flesh-eating bats found? The fruit-eating?
What enables them to fly?
Where do they stay during the day?
Of what use are bats?
Why do bats hang in clusters, head downward, during their long winter sleep?
Correlated subjects: Fox bat, vampire bat, and all common kinds.

Fish and Fisheries

General Description.
- Heart
- Blood
- Gills
- Fins
- Scales
- Eyes
- Vertebræ
- Bladder or sound
- Coloring
  - (a) Deep sea
  - (b) Fresh water
  - (c) Breeding season
- Eggs
  - (a) Where laid
  - (b) How cared for
  - (c) Number
  - (d) Young

Fishing Industries.
- United States
- Great Britain
- Canada

Salt Water.
- Shellfish
- Seals
- Corals
- Pearls
- Whales
- Turtles
- Sponges

Fish Proper.
- Cod
- Herring
- Halibut
- Mackerel
- Haddock, etc.

Fresh Water.
- Salmon
- Trout
- Whitefish
- Sturgeon
- Eel
- Pickerel
- Bass, etc.

Fishing Devices.
- Drawnets
- Stake-nets
- Hooks
- Harpoons

TEST QUESTIONS.

Have fish any ears? Any heart? How do they breathe?
Is their blood warm or cold?
What salt-water fish is able to swallow other fish though twice its own size?
Where are the highly colored fish found? At what season do these colors increase in brilliancy and beauty?
How many kinds of fish are known to exist now? How many kinds are extinct?
How do deep-sea fish compare in characteristics with fresh-water fish?
Where are flying-fish found, and why their name?
Where are the largest salmon fisheries in the United States? What is the average weight of the salmon?
How and for what great distances are fresh fish transported?
Where are the richest fishing grounds in the world?
What is the most important fish taken from the Atlantic? From the Great Lakes? From the Pacific?
What salt-water fish are supplied at your market? What fresh-water fish? Name three of each kind.
Name five species found in the waters of your own neighborhood.
Why have governments been careful to protect and encourage fisheries?
Tell how the government restocks certain lakes.
In what country is fishing the most important industry? Why your answer?
What remarkable size is attained by certain sharks?

Ants

HABITS.
1.
2.
3.
4.

FOOD.
Animal Food
Grains
Honey—dew
Parasites

COMMUNITIES.
Males
Females
Workers
Special workers or soldiers

HOMES.
Ant-hills
Nests
Tree trunks

TEST QUESTIONS ON ANTS.

Does the male ant do any work?
What are the household duties of the female?
What is done with the larvæ on warm days?
Do ants tunnel under rivers and build bridges?
Of what does each community of ants consist?
Which members are wingless?
What are some of the duties of the workers?
Why are some of the workers known as soldiers?
Where and how do most American ants build their nests?
Do they require food in winter?
Why do ants sometimes herd lice on plants?
How do they draw the sweet fluid from these parasites?
What are some of their acts which show wonderful intelligence?
How do some species dispose of their dead?
Why is the *umbrella* ant so called?
How does the *honey* ant come by its name?
Name some of the peculiarities you have noticed in your observation of ants.
What are white ants?
Proportionately, how much stronger would you say ants were than some of the large animals like the bear, the elephant?

ARMIES OF ANTS.

The bashikouay ants march through the forests of Central Africa in armies, often several miles in length. Along the lines are officers, who keep the army in order. If they come to a place where there are no trees they build underground tunnels, for they cannot bear the heat of the sun. When they are hungry they devour everything that comes in their way, large animals as well as small, and the negroes run for their lives. They will not touch vegetable matter, but vermin is destroyed instantly. All the insect world flies before an army of this kind.

When these ants want to cross a stream they form a living bridge with their own bodies over the water. This is done by a great number of ants, each clinging with his fore-claws to his next neighbor's body. Over this living bridge the whole army of ants march in order.

—*Morton.*

CLASSES.
Solitary.
(a) Mason-bee
(b) Carpenter-bee
Colony or Society.
(a) Honey-bee
(b) Bumble-bee
Eggs.
Size
Color
Shape
Where deposited
(a) For workers
(b) For drones
(c) For queens
Time for hatching

SPECIES.
Honeybee
Bumblebee

Swarm.
Number
Queen
Drones
Workers

Habits.
Flight
Honey gathering
Forming new swarms

TEST QUESTIONS.

What is a worker? A drone? A queen?
Could clover be successfully raised without the aid of bees? Why not?
How many queens are there in each swarm?
How many eggs does she lay in a single day?
What distinction is made between the eggs that give birth to *workers* and those that give birth to the *drones?*
Are the eggs which are to develop into queens laid in cells differing from the others?
On what is the queen fed?
Why are the drones so called?
How do the workers compare in numbers with other classes in the swarm?
In how many days do the eggs hatch?
How long and by what class are the larvæ fed?
When do the workers seal the larva up in the cell?
How long before it comes forth a bee?
When is a new queen allowed to appear in the swarm?
What becomes of the old queen?
What do the bees do in the winter?

Food of bees:
What is it?
How obtained?
How stored?

Enemies of the bee:
1.
2.
3.
4. Name them.

What plants furnish the most desirable honey?

AN ENEMY OF THE BEE.

A remarkable bird found in Mexico is the bee martin, which has a trick of ruffling up the feathers on the top of its head into the exact semblance of a beautiful flower, and when a bee comes along to sip honey from the supposed flower it is snapped up by the bird.

QUESTIONS.

How long is the alligator when fifteen years old? When full grown?

Were you born the same year with an alligator and lived to be 100 years old, what stage of growth would the reptile then have reached? Does the alligator outlive the elephant? The whale? The turtle? The camel?

How many dozen eggs are laid by the female? When and how are these hatched?

What animal does the alligator resemble?

Do alligators hibernate?

What is the disposition of the alligator?

Where do they eat their prey?

What is alligator leather used for?

Cork

TREE.

From what species of trees is cork obtained?

In what countries does it grow?

How old must the tree be before it produces?

BARK.

What part of the tree yields the cork?

Is the first stripping the best quality?

How many years does it take the tree to grow a new bark?

Is it the outer or the inner bark that produces the cork?

What is the thickness of this bark?

How is it removed from the tree?

USES.

What are some of the qualities of cork?

Why is it especially serviceable for the stopping of leaks in vessels?

In what other ways is it used?

CUTTING.

How many grades of cork are there?

What is done with cork to prevent its taking the temper out of knives that slice it up?

How many hundred times a minute does the disc-shaped knife revolve?

How many thousand corks can be cut a day?

How are the corks sorted for shipment?

Birch

VARIETIES.

Cherry birch
Black birch
Yellow birch
Paper birch
Dwarf birch

USES.

Timber
Furniture
Fish casks
Hoops
Wooden shoes
Paper
Canoes
Boxes

QUESTIONS.

What furniture have you, made from birch?

In what continents does the birch tree grow?

Describe its wood. Its bark.

What are some of the uses of the bark?

Why are fishing nets and sails steeped with it?

How is the oil used in Russia?
What can be made from the sap?
What variety furnished the bark from which Indians made their canoes?

Orange

Distribution.	Tree.	Fruit.	Harvest.
Asia	Height	Shape	Picked
Europe	Branches	Color	How
Africa	Leaves	Kinds	When
Australia	Flowers	Navels	Sorted
United States	Color	Blood orange	Packed
Florida	Fragrance	Russets	Shipped
California.	Shape	Mandarin	

TEST QUESTIONS.

What was the kind of orange you ate for breakfast? Where was it raised—in California or Florida? How can you tell?

How many kinds are kept at your grocer's store or nearest fruit stand?

Looking at the color illustration, what do you see remarkable about it?

Is it true of the apple to see ripe fruit and blossoms at the same time?

Why does the navel orange recommend itself to the consumer?

Of what country is the orange a native?

From what South American country was the orange introduced into California?

What is the height of the cultivated tree?

Name three of the most common varieties. Describe each in detail. Which is in the greatest demand in the United States?

Why is the blood orange so called? What is a mandarin?

Why are orange blossoms so popular with brides on their wedding day?

How many million trees are found in California? Florida?

How are oranges harvested, packed, and shipped to market?

What can you say of the orange as to food value?

Apple

Tree.
1. Height.
2. Bark.
3. Branches.

Leaves.
1. Shape.
2. Color.
3. Size.

Blossoms.
1. Color.
2. Fragrance.
3. Size.
4. Shoots.

Uses.
1.
2.
3.
4.

Fruit.
1. Size.
2. Shape.
3. Color.
4. Skin.
5. Pulp.
6. Core.
7. Seeds.
8. Cells.

Varieties.
1. Known in United States.
2. Number profitable.
3. Successful in any one locality.

Seedless and Coreless Apple.
1. Color.
2. Flavor.
3. Size.
4. Appearance.
5. Blossomless tree.

QUESTIONS ON THE APPLE.

To what family does the apple tree belong?

Of what continent is it a native?

What people introduced the apple into England? Into the United States?

What continent now leads in its production?

How many barrels will one tree yield in a season under favorable conditions?

From what two species have the two varieties been derived?

How many cultivated varieties of apples are known?

How many cultivated varieties are grown in the United States?

How many of these are profitable?

How many varieties are successful in any one locality?

Do the seeds produce the fruit from which they are taken?

How is vinegar made from apples?

Name five varieties found in your orchard or in the grocer's store?

How are orchard trees prepared?

What is grafting?

What states have the largest number of trees? What states produce the largest quantity of fruit?

Why is clover sown in an orchard to insure a good crop?

How many apple trees are there in the United States? How many barrels does the yearly crop amount to?

Who has succeeded in growing the seedless and coreless variety of apples?

What is peculiar about the skin of these apples?

Why is the blossomless tree an important feature of this variety?

What danger is removed by the lack of the flower?

What are the indications that the seedless apple will in time displace all the old seed-bearing varieties?

Peach

TREE.
- Size.
- Shape.
- Height.

BLOSSOMS.
- Color.
- Shape.
- Form.

LEAVES.
- Size.
- Shape.
- Color.

FRUIT.
- Classes.
- Size.
- Shape.
- Color.
- Skin.
- Stone.

DISTRIBUTION.
- In U. S.
- In states.
- Amount raised.

FAVORABLE CONDITIONS.
- Sandy soil.
- Sun.
- Warm temperate climate.

HARVESTING.
- Picking.
- Packing.
- Shipping.

QUESTIONS ON PEACH.

To what fruits is the peach allied?

In what country is it most extensively cultivated? In what climate does it thrive?

What sections of the United States are best adapted to its cultivation?

Is any other fruit raised more abundantly in this country?

Into what classes are peaches divided? What characterizes each class?

Describe some of the different kinds of peaches you have seen or eaten.

In what ways is this fruit used?

Name the peach growing states in the United States. What state grows the largest quantity?

Where are ostrich farms established in the United States?
For what purpose are these farms established?
What is the value of ostrich feathers? Why are they so greatly prized?

Dogs

I. Description.
  1. Size.
  2. Structure.
  3. Appearance.
  4. Characteristics.

II. Uses.
  1. Hunting.
  2. Protection.
  3. Commercial purposes.
    a. Leather.
    b. Miscellaneous.
  4. Transportation.

III. Classification.
  1. Wolf Dogs.
    a. Newfoundland.
    b. Eskimo.
    c. St. Bernard.
    d. Shepherd.
  2. Watch Dogs.
    a. German boarhound.
    b. Danish dog.
    c. Matin dog.
  3. Greyhounds.
    a. Scotch.
    b. Italian.
    c. Irish.
    d. Turkish.
    e. Russian.
  4. Hounds.
    a. Bloodhounds.
    b. Foxhound.
    c. Staghound.
    d. Setter.
    e. Pointer.
    f. Spaniel.
    g. Poodle, etc.
  5. Cur Dogs.
    a. Fox terrier.
    b. Skye terrier.
    c. Scotch terrier, etc.
  6. Mastiffs.
    a. Bulldog.
    b. Pug-dog, etc.

QUESTIONS.

Where are wild dogs found?
Why are bloodhounds so named?
What remarkable intelligence is displayed by the collie?
What other animals are included in the type to which the dog belongs?
How do dogs compare with other animals in affection and intelligence?
Which family of dogs furnishes the largest specimen? What is its weight?
From what does the St. Bernard derive its name?
What use did the monks of St. Bernard make of the dog?

How was the Newfoundland dog made use of in his native land? What are some of his strong points? Why does he make a good watch dog?

What great English painter used the Newfoundland dog as a subject for one of his famous paintings? (which see.)

Which is the most celebrated of all strains of shepherd dogs? What points show that it is adapted to outdoor life? Of what assistance is it to the shepherd?

What is the size and build of the Eskimo dog? Of what use is it in the Arctic regions? How many miles a day can it travel?

What is the most distinguishing feature of the greyhound? Has the name any reference to its color? From what is the name derived?

What special sense marks the difference between the hound and the greyhound?

Which shows the most affection for man, the smooth-haired or the rough haired variety?

Silk

I. Silk Moth.
  1. Description.
    a. Body.
    b. Legs.
    c. Wings.
    d. Number of eggs.

II. Silk Worms. (Wild.)

III. Silk Worms. (Culture.)
  1. Eggs.
    a. Number.
    b. Deposited when?
    c. Temperature for hatching.
    d. Time of incubation.
  2. Caterpillars.
    a. Early appearance.
    b. Care.
    c. Food.
    d. Development.
    e. Casting size.
    f. Body.
      Segments.
      Legs.
    g. Mouth.
    h. Color.
  3. Cocoon Development.
    a. Racks.
    b. Tubular glands.
    c. Spinneret.
    d. Time.
    e. Length of thread.
    f. Hatching.
      Time required.
      Prevention of.
    g. Proportionate weight in silk.
  4. Origin of Industry.

IV. Manufacture.
  1. Unwinding cocoons.
  2. Reeling silk.
    a. Description of process.
  3. Raw Silk.
    a. Why and when washed?
    b. How wound?
    c. How assorted?
  4. Throwing—Necessary before weaving.
    a. Spinning, twisting, reeling.
    b. Usually done by machinery.
    c. Regulation of twist.
    d. Single.
    e. Sewing silk.
  5. Doubling.
    a. Tram silk.
    b. Threads twisted in one direction.
  6. Organzine.
    a. Threads twisted in opposite directions
    b. Hard silk.
  7. Weaving.
    a. Modes.
    b. Peculiarities.
    c. Intriçacies.
  8. Waste Silk.
    a. Consists of what?
    b. Processes.
    c. Use.

V. Countries.
  1. Raw Silk.
    a. China, Japan, Italy, France.
  2. Manufactured Silk.
    a. France, Germany, Switzerland, United States.

VI. Colored Plate.

VII. Artificial Silk.
  1. Composition.
  2. How produced.
  3. Value.
  4. How extensively used?

QUESTIONS.

Turn to the color illustration and follow the development of this useful insect through its life. What do you see remarkable about some cocoons?

Give three reasons why silk is more expensive than cotton.

Name five materials made from silk in your home.

What people originated the silk industry? Are the people of this country still engaged in it?

What is the length of thread furnished by a cocoon? For what part of a mile would it stretch?

Why are not the cocoons intended for silk permitted to hatch? How is this prevented?

How many pounds of cocoons are required to yield one pound of raw silk? How many pounds of cocoons will an ounce of silk worms' eggs produce?

How are the eggs hatched artificially? What temperature is necessary? What is the time required? What is the food given and how prepared?

During the caterpillar stage of eight weeks how many times does the worm cast its skin?

How many legs has the caterpillar? With what are some provided?

When does the caterpillar become lazy and refuse to eat? When does it begin to spin its cocoon? How long does this take?

What are the leading silk-producing countries? Silk manufacturing?

What people have been the most ingenious in the invention of looms?

What is artificial silk? How is it made? How does it compare with natural silk in durability? In beauty?

Coral

I. Definition and Description.
II. Forms.
  1. Tree.
  2. Organ pipe coral.
  3. Brain.
  4. Reef.
    a. Where found?
    b. Construction.
    c. Characteristics.
    d. Atoll.
III. Colors.
  1. Pure white.
  2. Pink.
  3. Red.
  4. Black.
IV. Coral Fisheries.
  1. Location.
  2. Methods.
V. Commercial Value.
  1. Jewelry.
    a. Necklaces.
    b. Other ornaments.
VI. Markets.
  1. Naples.
  2. Genoa.

QUESTIONS.

What enables the coral insect to cling to the rock and draw food into its stomach?

What part of the insect becomes a contribution to the coral formation?

What is coral? What is a polyp?

Why is the tree coral so called? How is it formed?

Describe the organ pipe coral.

Which species of coral is most widely distributed?

What is interesting about the brain coral?

Which varieties are prized for jewelry?

Where are these varieties found?

Off what coasts are coral fisheries maintained?

What two cities are the chief centers of the coral industries?

What determines the value of coral?

Why is it that the coral polyp never builds to the surface of the water?

How are the upper portions of the reef built up?

Why do coral reefs take a circular form?

How do we know that the coral polyps have been working for many ages?

Correlated subjects: Coral Fish. Coral Sea. Coral Tree. Atoll.

Elephant

I. Description.
   1. Size.
      a. Height.
      b. Weight.
   2. Physical Construction.
      a. Limbs.
      b. Head, neck.
      c. Trunk.
      d. Skin.
      e. Tusks.
   3. Intelligence.
      a. Teachableness.
      b. Keen memory.
   4. Disposition.
      a. Timid.
      b. Obedient.
      c. Patient.

II. Species.
   1. Asiatic.
   2. African.

III. Habits.
   1. Lives how? Where?
   2. Rarely bred in domesticity.
   3. Great swimmer — delights in water.
   4. Food.

IV. Domestication of the Elephant.
   1. Plan of capture.
   2. Methods of training.

V. Uses.
   1. Beast of burden.
   2. War.

VI. Value.
   1. Commercial.
      a. Ivory.
      b. Menageries.
      c. Training.

QUESTIONS ON ELEPHANT.

How does the elephant compare in size with other animals?

How does the Asiatic elephant differ from the African?

Why is the African elephant seldom seen in captivity?

What is the greatest height to which elephants attain? What is their usual height?

What is their weight? Describe the body. The legs. The toes.

What is the most remarkable feature of the elephant? What is peculiar about the skin?

What use does the elephant make of its trunk?

Why are the tusks valuable? How much do they weigh?

Is the elephant's brain large or small in proportion to the size of its body?

How does the elephant compare with other animals in intelligence?

Which ones separate themselves from the herd and live solitary lives?

Why are these called rogues?

In what ways are wild elephants caught?

How are trained elephants used in capturing wild ones?

What great warrior had with him an army of elephants when he invaded Italy?

In what country have the animals been used to the greatest extent?

What part do they take in occasions of pomp and display?

How are they of use in lumbering?

INTERESTING FACTS ABOUT THE ELEPHANT.

To give lightness to what would be otherwise an insupportable weight, the cranial bones contain numerous large air cells.

Elephant feet are considered a great delicacy by some African tribes.

Bear

I. General Description.
  1. Construction.
    a. Head.
    b. Body.
    c. Limbs.
    d. Size.
    e. Weight.
    f. Fur, etc.
  2. Habits.
    a. Home.
      Winter.
      Summer.
    b. Hibernation.
    c. Care of young, etc.
  3. Food.
  4. Disposition.

II. Species.
  1. Name seven.
    a. Characteristics.
    b. Where found.

III. Uses and Value.
  1. Food.
  2. Fur, etc.

USES OF THE BEAR.

The natives of Kamchatka are indebted to the bear for many things which to them are the comforts of life. Beds, coverlets, bonnets and gloves are made from the skin; the flesh is used for food, as is also the fat; the intestines are used as a substitute for glass in windows and as masks for protecting the face from the glare of the sun; the shoulder blades are used for scythes to cut grass.

—*Morton.*

QUESTIONS.

How does the weight of a grizzly bear compare with that of a horse? A cow? How does the grizzly differ from other kinds of bear?

With what other animals have bears many features in common?

Why does the body of the bear appear more bulky than it really is?

In what way does the bear use its claws? What is peculiar about the movement of bears? Where do they usually make their homes?

Which species live almost entirely on fish?

In what ways is the bear of commercial value?

How does the polar bear differ from all the others? Why are its feet hairy on the soles?

Which kind of bear would it be most dangerous for you to meet on a hunting trip?

How could you easily identify the spectacled bear were you traveling in the Andes? Why so called?

How could you tell a honey bear? Where are honey bears found? Why so named?

What species of bear would you find on a hunting trip into northern Michigan? Into Canada? Into the Rocky Mountain regions? Into Kadiak Island, Alaska? Into the Arctic regions?

Which species is the most widespread?

Where is the home of the barren-ground bear?

Why is the Kadiak bear so called?

Cacao Tree

I. Where Found.
  1. Native.
  2. Cultivated.

II. Description.
  1. Tree.
  2. Fruit.
    a. Pods.
    b. Seeds.

III. Products.
  1. Cocoa.
  2. Chocolate.
  3. Cocoa Butter.

IV. Uses.
  1. Drinking purposes.
  2. Confections.
  3. Medicinal.

QUESTIONS.

By what process is the commercial chocolate made? Cocoa?
Where are these articles used largely as a beverage?
What is the commercial importance of each?
What per cent of fat do the seeds contain?
What element does chocolate contain that is lacking in cocoa?
How is cocoa butter used medicinally?
Describe the pod. How many seeds does it contain?
Give preparation of chocolate for shipment.
What is the height of the cocoa tree? What are the uses of cocoa butter?
First used in what country? What is the size of the cocoa bean?
Why are the beans roasted? How are the nibs reduced to paste?
How is the paste prepared for use?

Cocoanut

I. Where Found.
  1. Native.
  2. Cultivated.
II. Description.
  1. Tree.
    a. Name.
    b. Height.
    c. Leaves.
  2. Fruit or nuts.
    a. Size.
    b. Shape.
    c. Husk.
    d. Meat.
    e. Milk.
    f. Food.
III. Products of Nut.
  1. Oil (cocoanut butter).
    a. Soap.
    b. Candles.
  2. Cups, ladles, etc.
IV. Products of Tree.
  1. Food—bud at top of tree.
  2. Sap—wine.
  3. Leaves—to thatch cottages.
  4. Fibers—mats, cordage.
  5. Trunk—boats, timbers, etc.

QUESTIONS.

What part of the tree is made into wine? To what practical uses has the tree been put? The cocoanut?

Why is the fluid within the nut called milk? What is made from the trunks of the trees?

When do the trees begin to bear fruit? How long do they continue to produce?

For how many years does the cocoanut tree continue to bear without any attention?

How has the tree distributed itself to the tropical islands? What are some of the things made from the fiber?

What are the principal uses of the shells? The oil? The fruit? The leaves?

Cotton

I. Varieties.
  1. Long fiber or sea island cotton.
  2. Short fiber or upland cotton.

II. Where Raised.
  1. United States.
    a. Sections.
  2. Foreign Countries.
    b. Names.

III. Planting.
  1. Methods.
    a. Rows—distance apart.
    b. By what means.
  2. Season.

IV. Cultivation.
  1. Soil.
    a. Sandy loam—lime and phosphates.
    b. Heavy rainfall while planting.
  2. Dry season, to mature.
  3. Temperature.
    a. Not less than a mean annual temperature of 60 degrees.

V. Harvesting.
  1. Time.
    a. Bursting of pods or bolls.
  2. Picked by hand. All bolls not ripe at same time.
  3. Sent to gin house.
    a. Seeds removed by cotton gin.
    b. Pressed into bales of 500 lbs. each.

VI. Seaports, Raw Material.
  1. United States.
  2. Foreign.

VII. Factories.
  1. United States.
  2. Foreign Countries.

VIII. Products.
  1. Cloth.
    a. Clothing.
    b. Household furnishings.
  2. Cottolene.
  3. Fodder and Fertilizer.
    a. Seeds from which oil has been pressed ground into powder.

IX. History and Growth of Cotton Industry.
  a. Domestic.
  b. Foreign.

X. Colored Plate.

QUESTIONS.

What eight states lead in cotton production? What states make up the cotton belt?

At $50 per bale how does the cotton crop in the United States compare in value with the corn crop at 40 cents per bushel?

Which variety of cotton is most extensively cultivated in the United States?

What is the average height of the upland plant? Of the sea island?

From what does the sea island cotton take its name?

When and how are cotton seeds sown? How is cotton cultivated?

How long after the flowering has commenced until the seeds open?

How is cotton harvested? How is cotton separated from the seeds?

What is the oldest cotton-growing country? Who introduced the cotton shrub into Europe?

Where and when was cotton first planted in our country? What countries raise the world's supply?

What are our leading cotton ports?

How did the invention of the cotton gin affect the production of cotton?

Who invented the cotton gin? In what form is the cotton sent to the manufacturer?

How are cotton seeds utilized? What is the weight of a bale?

How much of the world's cotton is raised in the United States?

Name five materials made from cotton found in your home.

COTTON

1, Shipping Cotton.
2, Blossom.
3, Calico.
4, Cotton Plant.
5, Cotton Oil.
6, Cotton Fiber.
7, Boll open.
8, Cottonseed Meal.
9, Cottolene.
10, Spinning Frame.
11, Loom.
12, Gin and Press.
13, Cotton Field.

Frog

I. Tadpole.
  Young frog.
  1. Description.
    a. Head.
    b. Tail.
  2. Transformation.
    a. Body.
    b. Mouth.
    c. Gills.
    d. Legs.
    f. Tail.
  3. Food.
II. Mature Frog.
  1. Where found?
  2. How breathe?
  3. Movements.
    a. Water.
    b. Land.
  4. Food.
  5. Commercial value.

Toad

I. Tadpole.
  Young toad.
  1. Transformation.
    (See Frog.)
  2. Food.
II. Mature Toad.
  1. Description.
    a. Where found?
    b. Color.
    c. Warts.
    d. Species.
    e. Food.
      Kinds.
      Mode of obtaining.
    f. Movements.
    g. Uses.
      Pet.
      Destroys insects.
    h. Poisonous?

Lizard

I. Definition.
II. Description.
  1. Limbs.
  2. Body.
  3. Tail.
  4. Glands—peculiarity?
III. Species.
  1. Number?
IV. Where Found.
V. Food.
  1. Vegetable.
  2. Animal.
VI. Habits.
VII. Families.
  1. Skinks.
  2. Geckoes.
  3. Iguanas.
  4. Chameleons.
VIII. Heloderma.
  1. Gila Monster.
  2. Heloderma.

QUESTIONS.

By what means does the toad procure its food?

What is the breeding-place of the frog and toad?

How does the food of the tadpole differ from that of the mature frog? The mature toad?

How are frogs' legs regarded as a food? To what industry has this led?

Why are the toad and frog classed as amphibians?

What becomes of the tail of the tadpole?

Of the following points mention those that are common to both the toad and the frog, and those in which they differ: Home, appearance, tadpole stage, construction, breeding and food.

In what respect does the lizard resemble the frog or toad? In what respects do they differ?

What climate is adapted to the lizard?

What is their food?

Do the young resemble the mature lizard?

Why is the lizard classed among the reptiles?

How many species are there?

What is the Gila monster? Where found? Why dreaded?

A QUEER LIZARD.

In Australia is found the frilled lizard about two feet long including its tail. The loose skin about its throat, it can by some peculiarity erect to look like the broad lace collars of Queen Elizabeth's time. When frightened or startled this lizard rises on its hind legs and jumps like a kangaroo.

Butterflies

DESCRIPTION.
- Head.
  - Antennæ.
  - Eyes.
  - Tongue.
- Thorax.
- Legs.
- Wings.
  - Number.
  - Structure.
- Abdomen.

COLOR AND SIZE.
- Male.
- Female.
  - Temperate regions.
  - Tropical regions.

LIFE HISTORY.
1. Eggs.
   - How and where laid.
   - Time required for hatching.
     - In cold countries.
     - In tropical climates.
2. Caterpillar.
   - Definition.
   - Number of segments or rings.
   - Number of legs.
   - Covering of body.
   - Number of eyes.
   - Movements.
   - Food.
3. Chrysalis.
4. Insect.

CLASSIFICATION.
- Known Species.
  - In the world.
  - In United States.
  - In your neighborhood.
- American Families.
  - Brush-footed.
  - Metal marks.
  - Blues.
  - Swallowtails.
  - Skippers.
  - Coppers.
  - Hair streaks.

QUESTIONS.

What protection does nature provide the butterfly?

How many thousand kinds are known in the world? In the United States?

In what three ways do butterflies differ from moths?

Where are butterflies found whose wings measure eight inches from tip to tip?

How many legs has a butterfly? How many wings?

To what part of the body are the legs and wings attached?

On what do butterflies feed? How is their food obtained?

Name the five different families under which the North American butterflies are classed.

How do the species of the tropical countries compare with those of the temperate latitudes?

How and where are the eggs deposited? What is the period of incubation in warm countries during the summer months? In colder countries?

Do caterpillars ever eat flesh?

What is the duration of the larva stage in temperate climates? In cold regions?

In how many ways do caterpillars attach themselves to leaves?

How does the insect breathe in the pupa state?

How long does the pupa state continue?

What is the appearance of the imago when it comes out of the chrysalis?

How long before it becomes perfect and is ready for flight?

What is the best-known species of your own neighborhood? Name three.

TEST QUESTIONS ON OWL.

How were owls regarded in olden times?

What bird was sacred to Minerva and mentioned frequently in literature?

Is the owl entitled to the wisdom its look gives it?

What is characteristic of the owl's body?

To what peculiar feather formation about the eyes is due the owl's credit of wisdom?

What is peculiar about the owl's flight?

In what respect are the owl's toes similar to the human hand?

ANIMALS.

What animal has eyes on the ends of its horns, has one foot and moves very slowly?

Name a dozen different animals of your county, wild or domesticated.

How does the beaver build houses, gnaw down big trees and build dams? What feature has the beaver in common with the bee?

Where is the bandicoot rat found? How large is it? How is its flesh considered by the natives?

The cruel treatment to which the badger was once subjected gave rise to what word now in common use?

In what way is the earthworm of great help to the farmer?

What is a common practice of the fox at time of capture?

How do you pronounce "coyote?" What is the size of this animal?

Where are gorillas found? What do they eat?

Why has the dolphin been celebrated by poets?

What are anthropoid apes?

In what particular attitude do bats remain through winter?

To what uses is the buffalo put in India?

What is the average burden carried by strong camels and their rate of speed? What is the usual length of a camel's life?

Where is it supposed that cats were first domesticated?

In what country are there no deer?

When does a dog's growth cease and what is the highest limit of dog life?

What are the methods of capturing elephants, singly or in groups?

What is the height of the tallest of all animals?

What ancient people considered the hippopotamus a god?

From what comparatively small animal has the horse developed in the process of evolution?

Characteristics of what two animals are combined in the mule?

What is the general structure of the seal?

For how many centuries has whale fishing been an important industry?

What kind of ivory is preferred by dentists, and why?

Why do not the larger animals migrate?

In what respects do mammals differ from all other animals?

What products of a whale are of commercial value?

Give some characteristics of the rabbit. For what is it valued? In what country is it so plentiful as to be a menace?

Has the squirrel any commercial value?

Name all the common animals you know whose fur is used in the fur trade. How is it prepared and used?

What is the muskrat noted for? Where is it found?

What are the uses made of the different parts of the hog?

Why has the giraffe a small head?

From what source is angora wool obtained? What is astrakan wool?

Are coon skins used in the fur trade?

Name the uses to which all parts of the cow are put.

Which is the more useful when alive, the horse or cow? When dead?

Age of Whales—The age of whales is ascertained by the size and number of laminae of the whalebone, which increases yearly. Ages of 300 and 400 years have been assigned to whales from these indications.

BIRDS.

From what does the bobolink take its name? When does the bobolink lose his brilliant colors, become very fat and esteemed for his delicate flesh? What famous poet wrote a lyric about this bird? What is the color of its eggs? (See color plate.)

How does the albatross sleep in midocean? What happens when food is plentiful? How does it rank in regard to size?

How is the color of the canary bird brought about?

On how many national ensigns does the eagle appear?

What is remarkable about the speed of the road runner?

What are the most expensive feathers and why are they so rated?

What are the eight orders into which birds are divided?

What fossils prove an evolution of birds from reptiles?

When was the canary introduced into Europe?

What is the highest record for distance traveled by carrier pigeons recently made by an American pigeon?

From what eastern countries did all species of fowl originate?

What is the common wild goose of the United States?

How many species of humming birds are now known?

To what great age do parrots live?

What are some of the characteristics of the ostrich?

What are the birds of prey? Where is their home, and in what sense are they valuable?

What nation values the nest of the bird known as the swift as a food? Of what is it made?

What birds remain in the temperate zone all winter?

What is the cause of the migration of birds?

How do the birds of paradise get their name?

What is remarkable about the eider duck's down? What is the size of the duck? Where is it found and for what greatly prized?

FISH

How do oysters eat?

How would you distinguish an oyster from a clam? In what latitude are oyster beds found? At what age does the oyster attain its growth?

Describe the method of attack on oysters by the starfish.

Name the three varieties found in your home market.

What is the appearance of the oyster eggs?

As oysters develop what is one of their striking peculiarities?

Where would you fish for large-mouthed black bass, in lakes or streams? For the small-mouthed variety?

Where are bass caught weighing from 300 to 400 pounds?

What is peculiar of the balloon fish?

What city eats bluefish every year to the value of a quarter of a million dollars?

Where are blind fish found? How do you account for their blindness?

In what way does the archer fish capture insects several feet above the surface of the water?

How is cod fishing carried on? How many thousand hooks are put out by a single schooner?

For what unusual time can cuttle fish remain alive out of water?

Where is the greatest reservoir for the special cultivation of cod?

What three expeditions have contributed much to the knowledge concerning fish?

What effect have electrical fishes upon man?

For what is the flying fish noted?

What is the average size and weight of a salmon?

What variety of the clam has the largest shell known?

Which two countries are the chief centers of the oyster industry?

What are kitchen middens and where do they occur?

Name five kinds of fish common to the waters of your vicinity.

INSECTS.

Which does the biting, the male or female mosquito? How do mosquitoes spread disease? Describe the process in detail.

There are how many thousand species of bees?

How do ants capture other insects and use them as milch cows?

In how many remarkable ways does the beetle protect itself? Is any part of the globe free from this insect? How many thousand species are known?

What enables the fly to walk on the ceiling?

On what did the potato bug feed before the cultivation of this vegetable? What is its other name?

What people relished baked locusts for food?

How do grasshoppers produce their chirping noise?

During what seasons are chinch bugs most destructive? Describe their method of attacking wheat and other grains. What enormous damage do they cause yearly?

What peculiarity gives the army worm its name?

REPTILES.

To what remarkable length does the anaconda grow? Where is this snake found?

On what was it thought for a long time the chameleon lived? How does it change its color?

At what period of its existence does the frog live on its tail?

Why did the ancient Egyptians preserve the body of the alligator with the same care given the human body?

How is a rattlesnake's rattle produced?

What is the most important species of turtle? What is the weight of these? The length?

Where does the lizard lay its eggs only to abandon them?

What is the Gila monster? Where is it found? Is its bite deadly to man?

Which is the only one of the thousand species of lizard that is venomous?

What commercial value has the alligator?

To what class of animals are reptiles most closely related and how do they differ?

What part of the frog is relished as a food?

The most helpful books are those that in our early years serve as lights to pilot us into the wide harbor of the world's wisest and most inspiring literature.

—*James Wallingford.*

Psychology and Pedagogy

Psychology and *Pedagogy* are connected with those movements in education which deal directly with the student and the teacher. The foundation for this division is psychology. The general article on this subject is written from the viewpoint of the teacher and for the purpose of assisting those who are interested in learning the fundamental principles of this science and using them as a foundation for their methods in teaching. The articles on each of the important subdivisions, such as *Perception, Attention, Memory* and *Imagination,* contain directions for training the mental power described in the article. Not only teachers but parents will find these directions of great service.

The general article PEDAGOGY is in the main historical, giving a sketch of the pedagogical theories of the different periods of history and showing how one developed from the other and how the methods which are now in general use are the outgrowth of the principles and systems established by leading educators in the sixteenth, seventeenth and eighteenth centuries.

The general article *Methods of Teaching* is founded on the principles of psychology set forth in the general article on that subject, and the subordinate articles pertaining to it, such as *Memory, Imagination* and *Reason.* This article deals with the foundation principles of teaching which are applicable to the teaching of all subjects. Following this are descriptive articles on the two general methods known as the *Inductive Method* and the *Deductive Method.* The articles on special methods have a decidedly practical turn and show teachers how to proceed in a scientific and systematic manner in the teaching of the subjects to which these articles pertain, as shown in the list. The methods given in these special articles are based upon the principles in the general METHODS OF TEACHING.

The last division of the subject includes articles which are of general interest alike to parent and teacher. They do not pertain to any particular method of instruction, but bear a very close relation to all methods; hence they are given in this division. This comprehensive study of PSYCHOLOGY and METHODS OF TEACHING is so written that any one who has never studied the subjects can read them without difficulty and can easily grasp their meaning.

- MENTAL POWERS.
  - Knowing.
    - Perception.
      - Sense perception.
      - Realization of self.
      - Transferred perceptions.
      - Cultivation.
    - Memory.
      - Connection with habit.
      - Laws.
      - Kind.
      - Cultivation.
    - Imagination.
      - Phases.
      - Cultivation.
    - Thought.
      - Concept.
      - Judgment.
      - Reason.
      - Laws.
  - Feeling.
    - Classification.
      - Sensuous.
        - Organic.
        - Special.
      - Ideal.
        - Egoistic.
        - Altruistic.
    - Quality.
      - Pleasurable or Painful.
    - Intensity.
      - Amount of stimulus.
      - Prolongation of stimulus.
      - Change of stimulus.
    - Culture.
      - Childhood.
      - Effect of use.
  - Willing.
    - Attention.
      - Kinds.
      - Development.
    - Decision.
    - Execution.
    - Cultivation.

Marvelous as are the mind's achievements, we must note that it is as completely dependent upon the nervous system as is a plant upon sun, rain, and air. Suppose that a child of intelligent parents were ushered into the world without a nerve leading from its otherwise perfect brain to any portion of its body; with no optic nerve to transmit the glorious sensations from the eye, no auditory nerve to conduct the vibrations of the mother's voice, no tactile nerves to convey the touch of the hand, no olfactory nerve to rouse the brain with the delicate aroma from the orchards and the wild flowers in the spring, no gustatory, thermal, or muscular nerves. . . . No matter how perfect might be the child's brain and his inherited capacity for mental activities, his faculties would remain for his life shrouded in Egyptian darkness. Perception could give memory nothing to retain and thought could not weave her matchless fabrics without materials.

—*Halleck's Psychology and Psychic Culture.*

- PEDAGOGY.
  - Related Sciences.
    - Physical.
      - Biology.
      - Physiology.
    - Intellectual.
      - Logic.
      - Mathematics.
      - Natural sciences.
    - Moral.
      - History.
      - Literature.
      - Ethics.
  - Educational Movements. (History of Education).
    - Oriental Nations.
      - Relation to religion.
      - Importance of education.
      - Parseeism.
      - Education among the common people.
      - Education of women.
      - Israelites.
    - Ancient Classic Nations.
      - Development of the individual.
      - Greece.
        - Sparta.
        - Athenians.
      - Rome.
    - Christian Era in Europe.
      - Early Period.
      - Reformation.
    - United States.
      - Colonial period.
      - National period.
        - Land Grants.
        - Free Schools.
        - State Universities.
        - Bureau of Education.
  - Successive Methods.
    - Humanists.
      - The Early Christian Fathers.
      - Schoolman.
        - Monastic.
        - Knightly.
        - Secular.
    - Realists.
      - Contrast with Humanists.
      - Noted Educational Reformers.
      - Principles of Comenius (see extensive treatment).
    - The New Education.
      - Beginning.
      - Characteristics.
      - Reformers.
        - Locke.
        - Rousseau.
        - Pestalozzi.
      - Principles and Phases.
        - Child Study.
        - Subject Matter of Education.
        - Coördinative and Correlative.
        - Method of Teaching.
      - Bibliography.

QUESTIONS.—Psychology.

Which phase of mental activity, knowing or feeling, is first in consciousness?

What is the most difficult stage of thinking? What can you say of its development? What are the two general methods of reasoning?

What is the first act of the imagination in constructing the image?

Distinguish between memory and imagination.

What power of the mind would be exercised in thinking of the human head joined to the body of a horse?

Fairy tales belong to what phase of imagination?

Why are they adapted to the child mind?

During what period in life are most of our habits formed? Why?

In what way does interest differ from desire?

What is the relation of psychology to physiology?

What are the processes of obtaining an idea?

Explain how an action becomes a habit both from the mental and bodily standpoint.

Why is it true that good habits are our best friends, and that bad habits are our worst enemies?

Compare the child's process of obtaining knowledge with that of mature minds.

What powers of mind are cultivated in the moral education? The mental? The physical?

What three steps are necessary in thought? Explain them.

What do we mean by the term logic? Logical mind?

What are some of the actions in life taken care of through habit?

Give processes of acquiring habit.

If it were not for habit how would the higher powers of the mind suffer? Would there be any development? Why not?

Why is it difficult for people to change their views or channels of work in middle life or old age? Of what great benefit is this to the progress of the world?

Through what channels is the mind aroused?

How is perception related to sensation?

Are ideas obtained through sight and touch to be depended upon?

Which of the senses are the most reliable and generally most accurately trained?

How can perception be trained?

What is the difference between conception and perception?

What is the chief thing accomplished by thought?

What stage of thought is judgment? What is its particular work?

Reason is what stage in thought? What is its work?

Why are subjects that appeal to observation and thought power valuable for memory training?

What depends in later life upon formation of correct concepts in early training?

Define interest; imagination; attention; apperception.

Where is the force of habit stronger, in the physical or intellectual powers? At what times is habit a protection from a physical standpoint? The intellectual standpoint? The moral standpoint?

Correlated Subjects:

Apperception.	Syllogism.	Sensation.
Concept.	History of Education.	Interest.
Association of Ideas.	Logic.	Habit.
Education.	Child Study.	Reason.
Pedagogics.	Fatigue.	Methods of Teaching.
Judgment.	Correlation.	Philosophy.

PEDAGOGY.—Questions.

Child Study.—General.

What is included in child study? What is the aim? How can both teacher and parent assist in this?

By what is a child's ability limited?

Why should a teacher have knowledge of the physical condition of the child? Is this often ignored? With what results?

Why should a teacher be familiar with a child's environment at home? How does this affect her treatment of the individual child?

What effect does the mind have upon the body? The body upon the mind?

How has the subject of discipline changed? With what results?

What beneficial results have followed in the wake of kindergartens, normal schools, individual work by teacher, etc., in home, schools, community and to the child?

Methods.—General.

What is meant by the term "method?" Upon what should it be based?

What is a "device?" Its general use? Is it ever harmful? When?

Why is application, or use, the true test of all knowledge?

What in general should be the aim of a teacher in her methods?

What is the great end and aim of education?

Which are the more important, principles or facts?

Senses.

In what order are the senses developed?

What sense gives us the widest range of knowledge? What is the next in importance?

At what period of growth are the senses very keen?

Should any of the senses be trained to the neglect of the others? Is this often done in the schoolroom and home? What are the results?

Upon what powers of mind is the acquiring of knowledge based in the primary grades?

Attention.

How does fatigue affect the mind?

Distinguish between voluntary and involuntary attention.

In presenting a subject what are the processes in securing the attention of the child?

Why should a lesson be conducted from the known to the unknown?

Upon what does attention depend?

Why is it easier to secure the child's attention in the early hours of the morning?

Why are recitations so often dull? What is lacking?

Why is it that many people make a failure of life in a certain sense? Where and how could this have been remedied?

What are some of the methods of training the attention?

What is the importance of attention in the development of the mind?

What are some of the methods of awakening the interest of the pupil?

Distinguish between interest and desire.

Why is it easier to interest the child than the adult?

What should govern the length of a recitation?

What are some of the ways of stunting mental growth?

How does interest in the subject affect the memory?

How can a child be taught to observe carefully and correctly? What is the importance of this? What powers of mind depend upon correct observa-

tion? At what time in life is observation the most important source of information?

MEMORY.

Upon what does memory depend? When is it especially active?

What are some of the devices a teacher may use to strengthen memory?

Is it possible to have knowledge without memory?

Is a child supposed to memorize what he does not understand? If so, how far is it practical to do this and with what end in view?

Why is memory of so much importance? Is it really a part of every other power of the mind?

What studies are especially valuable for training the memory?

How is memory affected by repetition?

How does interest in the subject affect the memory? What is the importance of interest in class recitals from this standpoint?

IMAGINATION (see Questions).

HABIT.

To what does a repetition of an act finally lead?

In what ways does habit affect the physical, intellectual and moral nature?

What do we mean by a plastic condition of the mind or nervous system? Why are habits formed more easily in early youth? After what age are important habits seldom formed?

In what ways can a teacher assist in the formation of good habits?

How does habit determine character ?

REASON.

At what age is a child supposed to begin to reason? What studies in the lower grades develop the reasoning powers?

What is the importance of judgment in reasoning and upon what does it primarily depend?

To what grade of school work is the inductive method of reasoning best adapted?

What is the deductive method of reasoning and to what department of school work is it best adapted?

WILL.

What is instinct? What finally results from it?

What is the difference between an impulse and a desire? In which is the will brought into action?

What is meant by deliberation? To what action does it lead? What is the difference between a mature will and that of a child?

Why does choice involve so many difficulties?

Is will the means of preventing action as well as performing it? Give examples of both states of mind.

How may the will be cultivated? What factor is it in the formation of habits?

Upon what is stubbornness based? Is it an action of the will?

Will exercises what control over the feelings? Does its control extend at last to all mental powers? With what effect?

Why is will the highest of mental powers?

IMAGINATION.

Of what practical use is imagination? Upon what is worry based? Cheerfulness?

Difficult experiences in arithmetic, grammar and other studies are due to what?

Which is the broader term, memory or imagination?

Physics

I. Matter.
- 1. Definition.
- 2. States.
  - a. Solid.
  - b. Liquid.
  - c. Gaseous.

II. Properties of Matter.
- 1. Adhesion.
- 2. Cohesion.
- 3. Porosity.
- 4. Density.
- 5. Impenetrability.
- 6. Ductility.
- 7. Malleability.
- 8. Tenacity.
- 9. Hardness.
- 10. Divisibility.

III. Mechanics or Dynamics.
- 1. Force.
  - a. Energy.
    - 1. Kinetic.
    - 2. Potential.
  - b. Composition of forces.
  - c. Parallelogram of forces.
  - d. Momentum.
- 2. Gravity.
  - a. Falling bodies.
  - b. Center of gravity.
  - c. Specific gravity.
- 3. Pendulum.
- 4. Mechanical Powers.
  - a. Lever.
  - b. Wheel and axle.
  - c. Inclined plane
  - d. Screw
  - e. Pulley.
  - f. Wedge.

IV. Pneumatics.
- 1. Properties of gases.
- 2. Laws of gases.
- 3. Application of laws.
- 4. The atmosphere.
- 5. Water vapor.
- 6. Steam.

V. Light.
- 1. Sources.
  - a. Sun.
  - b. Chemical action.
  - c. Mechanical action.
- 2. Reflection.
- 3. Refraction.
- 4. Diffraction.
- 5. Diffusion.
- 6. Polarization.
- 7. Abberation.
- 8. Actinism.
- 9. Color.
- 10. Spectrum analysis.
- 11. Rainbow.
- 12. Photometry.
- 13. Mirror.
- 14. Fluoroscope.
- 15. Mirage.
- 16. Aurora borealis.
- 17. N-rays.
- 18. Cathode rays.
- 19. Roentgen or "X" rays.
- 20. Lightning.

VI. Electricity.
- 1. Definition and theories.
  - a. What electricity is.
  - b. How produced.
- 2. Kinds.
  - a. Static or frictional.
  - b. Voltaic.
  - c. Positive.
  - d. Negative.
- 3. Laws and applications.
  - a. How electricity travels.
  - b. Motive power, etc.
  - c. Electric light.
  - d. Electric heating.
- 4. Uses in Medicine.

VII. Magnetism.
1. Theories.
2. Kinds.
a. Natural.
b. Artificial.
c. Electro-magnetism.
3. Magnet.
a. Properties.
b. Armature.
4. Magnetic needle.
5. Laws and applications.

VIII. Physical Instruments.
1. Accumulator.
2. Aerostatic press.
3. Air compressor.
4. Air pump.
5. Archimedean screw.
6. Arc light.
7. Argand lamp.
8. Armature.
9. Barker's mill.
10. Barometer.
11. Blowpipe.
12. Crooke's tubes.
13. Camera lucida.
14. Camera obscura.
15. Electric battery.
16. Electric generator.
17. Electric machine.
18. Dynamo.
19. Electric meter.
20. Electric motor.
21. Electrode.
22. Electrophorus.
23. Electroscope.
24. Geissler tubes.
25. Induction coil.
26. Insulator.
27. Leyden jar.
28. Object glass.
29. Siphon.
30. Spectroscope.
31. Storage battery.
32. Voltmeter.

IX. Miscellaneous.
1. Avogadro's law.
2. Boyle's law.
3. Demonstration.
4. Ether.
5. Fata Morgana.
6. Ice.
7. Liquid Air.

QUESTIONS—PHYSICS.

What makes it so difficult to walk on ice?

Where is it desirous to do away absolutely with friction? What means are used to do this?

What forces are overcome in withdrawing a nail?

Give a short explanation of what would result if friction did not exist.

Give practical examples of cohesion and adhesion.

Which learns to walk more easily, the biped or quadruped? Why?

What is meant by the term "cold?"

What do you understand by temperature?

Why do you rub your hands together when cold?

Why does fire produce heat?

What do we mean by a conductor of heat? By what method is a poker heated? A flatiron?

Why are iron tools fitted with wooden handles?

When you touch ice, is it giving off cold or your hand giving up heat?

Does a fur coat produce heat? Why is it warm?

Why do you wear woolen garments in winter?

You stand at a heating stove to get warm; explain why?

How is heat imparted to the water in a teakettle?

How does the sun heat the earth?

How is the expansion of heat used in practical ways? What are the uses of steam?

Why are feathers a warm covering for birds?
Why do men wear woolens in attending to furnaces?
What is the principle of the double window in winter?
When both are in the same temperature, which is colder, marble or wood?
How long does an object feel cold?
Why do we poke a fire to make it burn better?
What do we mean by "soft water"?
What is the cause of twilight?
Why do the stars seem to twinkle?
What is sound? Why can we be heard a greater distance by speaking through tubes?
Of what metal are lightning rods usually made?
Why is it dangerous to sit near a chimney during an electrical storm?
What substances are good conductors of electricity? Poor?
What is the distance of the sun from the earth? At what rate does light travel?
Some miles from the earth total darkness reigns. Explain light upon the earth.
Why does more rain fall by night than by day?
Why are clear nights usually cold?
Why does little dew form at the base of hedges and around the roots of trees?
Why is a running jump longer than a standing one?
What causes the formation of the rainbow?
What is a mirage? What produces the echo?
Ten inches of snow is equal to how many inches of rain?
What causes dew? Frost? Fog? What enables you to see your breath on a cold day?
Correlated subjects: Rœntgen Rays, Electrolysis, Dynamo, Electric Light, Hydrometer, Falling Bodies, Expansion, Ether, Water Wheels, Electro Magnet.

Heat

I. Theory and Definition.
II. Sources.
  1. Natural.
    a. Sun.
  2. Artificial.
    a. Friction.
    b. Chemical action, electricity, etc.
III. Modes of Travel.
  1. Conduction.
  2. Convection.
  3. Radiation.
IV. Effects.
  1. Expansion.
    a. Changes solids to liquids.
  2. Produces light.
V. Practical Application of Laws of Heat.

QUESTIONS—HEAT.

What happens if a hot iron is placed on a cold one?
Can a body be cold and yet have heat?
What is heat?
Where does it come from?
Do the stars give off heat?
What causes fire?
How are our bodies heated?
How does heat travel?

What is the meaning of conduction?
What happens to the size of a body when heated?
Why are wagon tires made a little smaller than the rim of the wheel?
Give examples in expansion.
What happens to camphor when heated to a high temperature?
How does heat produce light? What body gives us both heat and light?
How do fur garments keep us warm?

QUESTIONS—LIGHTNING.

What causes lightning?
Is there lightning in cold weather? Why not?
When does lightning strike the earth?
What causes a thunderbolt?
Does the echo play any part in the loud peals of thunder heard?
Who invented the lightning rod?

QUESTIONS—ILLUMINATING GAS.

Who first used illuminating gas successfully?
When was it first introduced into England?
How is illuminating gas made?
What is coal gas? How made?
Where was the first coal gas obtained?
In making gas out of coal, what becomes of the tar and ammonia?
What is the condenser?
What is the use of a meter?
How is water gas made?
Which is the cheaper, coal gas or water gas?
How does oil gas differ from water gas?

QUESTIONS—ICE.

At what temperature does water freeze?
When water freezes, how much does it increase its bulk?
Which is the heavier, ice or water?
Why does a pitcher break when water freezes in it?
Where is natural ice obtained?
What is the first step in harvesting ice?
How is the cutting done?
From what material are the ice houses made?
What is the ice packed in?
Where is the most expensive ice harvesting?
How is ice manufactured?
How is the marking done in harvesting the ice?
How is the ice hauled to icehouse?

QUESTIONS—LIGHT.

What is light? Where does it come from?
How is it produced?
The union of what two chemicals produces candle, lamp and gas light?
How is electric light produced?
How does light travel?
How fast does it travel? Does it travel faster than sound?
How many minutes does it take light to reach the earth from the sun?
How many years does it take for light to reach the earth from certain stars? Why?
What is the substance called that permits light to pass through it?
What is refraction?

When I get a little money I buy books; and if any is left, I buy food and clothes.
—*Erasmus.*

Physiology

The study of PHYSIOLOGY is very interesting, but its value to the average student is in the fact that it acquaints him with knowledge that ministers to his well being.

This knowledge is originally gained by observation, experiment and by studying the conditions of diseases. While the information is of value from an educational standpoint, the care of the body, the prevention of diseases and the development of powers resulting in a better physique and longer life are the direct results of this study. Every home and school should be the center of such investigation.

It is impossible to carry on this study successfully without some sort of a guide. The suggestive outlines and questions here presented, with the practical treatment of these interesting subjects in THE NEW PRACTICAL REFERENCE LIBRARY, all presented in simple language by editors representing the latest research, opens up a field of study that should be utilized in every home and school.

For the guidance of the student we furnish herewith a general outline covering the subject as a whole. In addition we give you an outline covering the system of CIRCULATION and one of the subdivisions of the senses.

These outlines are simply developed from the material supplied in THE NEW PRACTICAL REFERENCE LIBRARY under the various headings related to same, and if the student will but make a complete outline covering the entire subject in accordance with the suggestions here submitted he will not only have an exhaustive study for future reference but the education it affords will be a source of untold pleasure and profit.

Human Body

Origin.
Cell.
Tissues.
Composition.
Organs.
Health.

I. BONES.
- Number.
- Structure.
- Kinds.
- Growth.
- Divisions.
- Articulation.
- Uses.
- Hygiene.
- Disease.

II. MUSCLES.
- Number.
- Structure.
- Kinds.
- Parts.
- Contraction.
- Use.
- Wonders.
- Hygiene.
- Disease.

III. Digestion.
- Organs.
- Secretion.
- Food.
- Processes.
- Wonders.
- Hygiene.
- Disease.

IV. Circulation.
- (See extensive outline.)

V. Respiration.
- Organs.
- Movements.
- Frequency.
- Air.
- Uses.
- Modifications.
- Hygiene.
- Diseases.

VI. Nervous System.
- Definition.
- Organs.
- Uses.
- Special Sense.
  - Feeling.
  - Taste.
  - Smell.
  - Sight.
  - Hearing.
  - (See exhaustive outline on Ear.)
- Hygiene.
- Diseases.

QUESTIONS—PHYSIOLOGY.

How many bones are there in the human body?

In what way is a combination of strength and elasticity secured for the spinal column?

How many bones in the head? Why is the brain so carefully protected?

What is the bone formation of the wrist?

Describe motion of shoulder blade.

Between what ages does the condition of bone reach perfection?

Are teeth a part of the skeleton or of the skin structure?

What is the difference between the joint at the upper end of the ulna and the humerus? Can you detect a reason?

Of what is the hip bone, or tibia, at its upper extremity a good example as to joint? Give reason.

Can you give any reason for the fibula bone?

What is the science of Osteopathy?

Why are the bones more liable to break in old age than in youth?

What is the function of the muscular system? What surrounds the muscles and for what reason?

Into what groups are muscles divided?

What is necessary for muscular action?

Of what in general does the circulatory system consist?

What is the function of the lungs? What does oxygen do for the blood?

What aid do plants render to the blood?

Give the process by which the blood gives up its nourishment and carries away waste.

In what respect do the veins differ from the arteries?

What are capillaries? What is the function of the lymphatic glands?

What are the two great nerve systems? In general, what is the function of each?

In a case of indigestion, to which nervous system will the message be sent?

By what means has our knowledge of physiology been attained?

What is the specific gravity of blood? What is the proportion of white corpuscles to red corpuscles? What is the temperature of the blood?

What is the most important characteristic of the blood?

How does the human brain compare in size and weight with that of other animals?

How does the weight of the cerebellum compare with that of the cerebrum?

What are the two great series of changes continually going on in the body?

In general what are the functions of the human body?

Describe the work of the salivary glands.

Give in general the function of the spinal cord.

How does the nervous system in some measure control the heart?

What is the chief use of fat?

By what device is the blood brought in contact with the air?

What are the relative positions of liver and stomach?

Is idiocy in any way dependent upon the size of the brain?

What are the organs of special sense?

What special protection is provided for the heart?

Would you expect the mitral valves to open upward or downward?

Look up different articles on the subject and explain how bones are renewed.

Give the effect of iron upon the blood.

Explain the action of blood in case of a wound.

What is the function of the kidneys.

Why has blood a salty taste?

Could a person bleed to death from a small wound?

In case of general debility, in what condition would you find the blood?

The sensation of sight is carried by what nerve?

Do you think it possible to hear after the outer ear has been injured? If so, by what method?

Why is the aorta important?

What do you know of William Harvey?

Is there any difference between germs and bacteria?

Explain the term, "Germ Theory of Disease." How would you regard the spittle of a consumptive in reference to this theory?

What is the cause of tuberculosis of the kidneys, bowels, bones, etc.?

By what means is the waste material thrown off from the body?

Why are thin garments worn in summer?

What do you mean by the term "Out of breath"?

What are the causes of appendicitis? Is this disease connected with bacteria in any way? What is the particular danger in the disease?

In what part of the world does cholera occur? Why?

Explain the difference between allopathy, osteopathy and homeopathy.

To what end is the stethoscope used by the physician?

What are the causes leading to apoplexy?

Explain the growth of the hair, nails, etc.

In general trace the blood from the time it leaves the left ventricle until it returns to it.

How does the weight of the blood compare with that of the body?

Explain how blood is propelled through the body.

What are some of the causes of indigestion?

Why is mastication of food so important?

What is meant by a vital organ? Name and locate the vital organs.

What do we mean by chronic diseases? Name a few and the causes of same.

What is the function of tears?

In what manner is the skull constructed in order to protect the brain?

In case of cutting the thigh in front, where would you bind the wound, above or below?

What ultimately becomes of all fat taken into the body?

If receiving a wound, how can one tell whether the bleeding results from an injury to a vein or artery?

What are the causes of cancer?

Circulation

I. Organs.
   1. Heart.
   2. Arteries.
   3. Capillaries.
   4. Veins.

II. Systems.
   1. Pulmonic.
   2. Systemic.

III. Blood.
   1. Definition.
   2. Amount.
   3. Temperature.
   4. Kinds.
   5. Composition.
   6. Coagulation.

IV. Osmosis—Interchange of Blood Elements.

V. Causes of—
   1. Force of heat.
   2. Elasticity of arterial walls.
   3. Muscular action.
   4. Suction from veins.
   5. Suction in inspiration.

VI. Functions.
   1. Nourishment.
   2. Purification.
   3. Elimination.
   4. Warmth.

VII. Hygiene.
   1. Accident.
   2. Effect of exercise.
   3. Effect of air and sunlight.
   4. Effect of chill.
   5. Effect of pressure.

VIII. Diseases.
   1. Congestions.
   2. Inflammation.
   3. Scrofula.
   4. Cold.
   5. Catarrh.

IX. Related Processes.
   1. Absorption.
   2. Assimilation.
   3. Secretion.
   4. Excretions.

ORGANS OF CIRCULATION.

I. Heart.
   1. Definition.
   2. Shape.
   3. Size.
   4. Situation.
   5. Relation to surrounding parts.
   6. Weight.
   7. Proportion to body's weight.
   8. Structure.
   9. Parts.
   10. Openings.
   11. Valves.
   12. Nerve supply.
   13. Movement.
   14. The heart's work.

II. Arteries.
   1. Distribution.
   2. Coats.
   3. Circulation in arteries.
   4. Pulse.
   5. Anastomosing.

III. Capillaries.
   1. Definition.
   2. Coats.
   3. Diameter.
   4. Circulation in capillaries.
   5. Office.

IV. Veins.
   1. Definition.
   2. Coats.
   3. Valves.
   4. Circulation in veins.
   5. Compare with arteries and capillaries.

QUESTIONS.

What is circulation? Name the organs of circulation.

Describe the heart. Define arteries; veins.

Describe the circulation of the blood. Of what is blood composed?

What are the uses of the blood? What is the normal temperature of the blood?

What is the color of the blood in the veins? In the arteries? What causes the change?

Describe coagulation. What are the parts coagulated? What is the serum?

Give the functions of the red corpuscles.

What are the commercial uses of the blood?

Who were the first people who used the blood from butchered animals in making blood cake and blood sausage?

Fertilizers manufactured from blood sell at what price per ton?

Blood is used in the manufacture of what very important article of diet?

In what way is blood used in the manufacture of buttons? Imitation tortoise shell?

For what manufacturing purpose do the Japanese use blood extensively? For what do physicians frequently prescribe blood? Where can a supply be obtained?

Was the circulation of the blood known at the time of the discovery of America?

Who first examined the circulation of blood in the web of a frog's foot? When?

Distinguish between the pulmonic and systemic circulation.

What vein carries the blood to the liver? What is the function of the hepatic veins?

How long does it take the blood to make a complete circuit of the system?

How long does it take the whole amount of blood to pass through the heart?

What part of the weight of the body is the blood?

The skeleton of an adult is said to weigh 14 pounds. Does the blood weigh more or less?

A person of average weight (154 pounds) is said to have approximately 100 pounds water, 60 pounds muscle, 14 pounds bone, 12 pounds blood and 4 pounds brains. How do you reconcile these figures?

What four forces propel the blood?

What is the arch of the aorta? Does the aorta pass through the diaphragm?

Name the divisions of the aorta which supply the pelvis and lower extremities.

What is the name of the minute endings of the arteries connecting them with the veins?

Why is the inner coat of the arteries smooth?

Which coat of the arteries assists in propelling the blood? How?

When does an artery become a capillary?

What do you understand by the term "Anastomosis"? Explain its function.

How may one check the flow of an artery when severed?

Where are the capillaries the largest? Where are the smallest capillaries? How can you illustrate their size?

How does the heart of a reptile differ from other animals?

How is the heart suspended in the chest? With what is the heart surrounded?

Ear

Definition.
Situation.
Acoustic contrivances.
Parts.

I. External.
  1. Convoluted portion.
    Adaptability.
    Helix.
  2. Auditory canal.
    Length.

II. Tympanum.
  1. Definition.
  2. Situation.
  3. Size.
  4. Cavity.
  5. Opening.
  6. Filled with.
  7. Ossicles.
    Number.
    Names.
    Arrangement.
    Action.
    Function.
  8. Eustachian Tube.
    Definition.
    Length.
    Function.
    Connects what?
  9. Tympanic membrane.
    Position.
    Action.
    Function.

III. Labyrinth.
  1. Comparative anatomy.
  2. Situation.
  3. Bony labyrinth.
  4. Membranous labyrinth.
  5. Fluid.
  6. Vestibule.
    Opening into tympanum.
    Opening for auditory nerves.
    Opening for cochlea.
    Five openings into semi-circular canal.
    Otoliths.
    Fluid.
  7. Semi-circular canals.
    Number.
    Names.
    Positions.
    Function.
  8. Cochlea.
    Resemblance.
    Columella.
    Organ of Corti.
    Divisions.
    Partitions.

QUESTIONS.

What is the ear? What is the outer ear? What separates the outer from the middle ear?

What are the three bones of the middle ear?

What is the educational value of training the sense of hearing?

How does the teaching of music develop the sense of hearing?

Why should the teacher understand the mechanism of the ear? How can she use this knowledge to benefit her pupils?

What are the parts of the inner ear? What are the organs of Corti?

Trace the transmission of sound from the outer ear to the brain.

Name bones of middle ear and describe their action.

What is the comparative size of the ear and its capacity of receiving sound in the lower animals?

Give three proofs showing the delicate sense of hearing in birds.

What animals are very dull in this sense?

In what animals is the hearing located in the legs? Is this also true of most insects?

How does the beetle hold its antenules in order to detect sound?

What animals have the keenest sense of hearing?

Is it possible for some animals to hear sounds which are pitched too high for the compass of the human ear?

Give three ways for influencing the propagation of sound to the tympanum.

What are the names of the nerves of hearing?

How are sound waves attracted to the auditory canal?

What is the eardrum? To what is it attached? How is its inner surface lined?

How does air enter the middle ear?

What is the eustachian tube?

Why are the bones of the middle ear called hammer, anvil and stirrup?

How are the vibrations of the eardrum transferred to the internal ear?

Where is the internal ear located?

How are the semicircular canals connected with the vestibule?

Why is the cochlea or snail shell so called?

Of what use is the fluid in the internal ear?

How are the sound vibrations which enter the ear reproduced?

How do the bones of the middle ear affect the vibrations?

What parts of the inner ear operate the same as do the strings of a piano?

What regulates the tension of the eardrum?

How are we enabled to recognize a multitude of sounds?

The thought we need, the facts we are in search of, may make their appearance in the corner of the newspaper, or in some forgotten volume long ago consigned to dust and oblivion.

—*Charles F. Richardson.*

Physical Culture

EDMUND P. RUCKER.

INTRODUCTION.

Never before in the history of our country has there been a time when attention to health and the means for securing and preserving it were so general as at the present day. As a people we are beginning to realize the importance of the proper care of the body. We have been brought to this viewpoint by the conditions of living which our industrial system has forced upon us. Physical culture, therefore, is not only beneficial to all, but it is to many absolutely essential to the preservation of health.

More than one-third of the people of the United States live in cities, and many of this number are crowded into tenements where they are partially or wholly deprived of pure air and sunlight—the best agencies for the preservation of health. Moreover, many men and women are engaged in occupations which confine them for long hours in such positions as to cause a constant strain upon some organs, while leaving others inactive. Unless these people take exercise calculated to strengthen these inactive organs, the system becomes unbalanced and health fails.

Poorly ventilated factories, stores and dwellings, occupations which prevent free exercise of the respiratory muscles, in many instances prevent proper purification of the blood and lead to disease. For all these reasons physical culture becomes a necessity.

Life is a battle in which victory goes to the strong. We see many failures in life because of physical weakness, and in numerous instances this weakness can be traced to neglect of proper physical training during the period of childhood and youth. In other instances physical weakness is due to the individual's neglect of proper exercise, his failure to obtain sufficient sleep, his carelessness in regard to ventilation, and his excessive indulgence in highly seasoned food and in stimulants.

The EDUCATOR volume of THE NEW PRACTICAL REFERENCE LIBRARY aims to present in a clear and simple manner a discussion of the progress which the scientific world has made in recent years in the direction of health culture. Civilization is advancing by leaps and bounds. Man is conquering the forces of nature, and in no field of investigation has advancement been more rapid than in that of the prevention of disease and in general health building. Some of the greatest scientific minds of Europe and America have been long engaged in working out laws of health, and now fixed principles may be laid down by which humanity seems destined to be restored to its rightful heritage—perfect health.

PRESENT CONDITIONS

Problems still remain to be solved, but there are many universally accepted rules by which a systematic course of physical improvement may be prescribed

for general guidance. The leading universities of the world have awakened to the importance of health culture and disease prevention, and are establishing departments under one name or another for studying and disseminating knowledge about these subjects. Wealthy philanthropists are giving their means and time to sustain scientific study of disease, and the result is of incalculable value to the race. The public schools have joined in this movement and in many schools physical instruction for both pupils and teachers is regarded as an important part of the work.

Few people today have the time or the inclination to review technical and exhaustive health treatises, or to analyze tables of laboratory or training-camp experiments, and are therefore deprived of knowledge of great value.

Many parents are still living in the belief that health is a matter of good or ill luck; that illness comes to us as the result of divine displeasure or indifference. Probably they do not know that there are definite laws of health, just as there are laws of business or government. Perhaps they think there are too many complicated influences such as heredity, environment, accident, temperament, germs and other intangible forces for good or ill for them to reckon with. Others say, "Oh, I'll leave those matters to the family physician. If the children get ill it is time to send for the physician." We quite agree that a skilful physician is one's best friend in time of sickness. The physician and surgeon have a very important mission in the world, and it is one of the noblest attributes of a noble profession that it is concerning itself as much with the prevention as with the cure of disease.

Action Necessary

But why wait till illness actually comes before concerning yourself with the question of health? Why not build up and fortify your system and the systems of your children against the attack of germs? Why not attain such a degree of vitality and power of resistance to disease that you no longer live in terror of drafts, wet feet and contagion? Why not give the children of the land such a degree of vigor that they will go through life enjoying every minute of existence and be able to overcome cheerfully obstacles and discouragements which crush others not so well prepared?

The ancient Greeks, in this respect, were far ahead of us today with all our boasted civilization. The care of the body then was of equal importance with the cultivation of the mind, and through systematic habits of exercise and diet, the Greeks attained a perfection of mind and body, a harmonious adjustment of the mental and physical, that made them the wonder and admiration of the pagan world, and even today we must go to the Greek statues and the Greek philosophers for our highest ideals of physical and intellectual perfection. The Greek tutors and parents understood better than we of this enlightened age, the necessity of giving the mind a healthy, vigorous body from which to derive its power, and the almost universal success they achieved in bodily training, shows how well they understood the principles on which such training should be based.

It is to be regretted that a large percent of the ills of humanity is due to ignorance of the laws of health. Thousands of school children struggle for an education under serious disadvantages of physical weakness, if not of actual disease, when the trouble lies wholly in the mode of living adopted or permitted by the parents. This condition is simply the result of the law of cause and effect, a law which is never suppressed in nature. If children are weak, nervous, anemic, irritable, stupid or inattentive, there is a reason for it, and the parent should trace back this reason from effect to cause. The suggestions on the follow-

ing pages are designed to assist not only parents but all others to apply the health principles in a practical way.

Many parents say that their children are not ill; that they are well and strong. Then it is the duty of such parents to keep their children in this condition. However, we should bear in mind that their vigor may be more apparent than real. Big biceps and a bigger appetite do not always indicate vital power. Muscular development secured at the expense of the nervous system is a menace rather than a safeguard. *Keep ever in mind that endurance and resistance to disease are things to be desired.*

A boy or man may have a fine physique; he may be able to lift great weights, and yet be vulnerable to disease germs. The test lies in endurance. Endurance means the power to sustain work for a great length of time without undue fatigue or exhaustion. *Fatigue comes from the accumulation of body wastes.* High power of endurance indicates that the body is comparatively free from these wastes or poisons.

Endurance has been one of the secrets of success of the world's great men, such as Washington, Napoleon, Gladstone and ex-President Roosevelt, whose achievements are so recent that they are easily recalled. Yet this man of iron will, and almost unlimited endurance was at one time in poor health and obliged to remove to the plains and live for a while in the open air. However, while in certain cases a change of climate or scene is beneficial, you can begin right in your own home the work of health-building, and in nearly all cases carry it to a successful issue.

Exercise

The value of exercise as a health-building agent is coming to be generally recognized. That pronounced physiological effects may be produced and morbid conditions relieved by exercise is universally admitted. However, we must remember that exercise may be made harmful as well as beneficial. Sometimes the prescribing of exercise in proper kinds and amounts calls for the most exacting and mature judgment. It is not uncommon to hear people say that exercise does not agree with them. Doubtless the fault is not in the exercise of itself, but in the way in which it is applied.

Authorities agree that an imposing muscular system is not a sure indication of health. Health depends on perfect functional activity, that is, harmonious action of the vital organs, such as the stomach, the heart, the kidneys, the liver and the lungs. These organs are all encased in the trunk of the body. It may be said that it is in the trunk that the individual lives. This is the human power house. The limbs may be amputated and yet the vital organs will go on doing their work as before, and the individual may enjoy good health. But once impair the efficiency of any of these vital organs, and you have a condition of ill health to a greater or a lesser degree.

It is therefore to the trunk of the body with its vital contents that modern physical culture experts direct their attention. The more perfectly the vital organs coördinate, the higher the individual's vitality. It has been found that there is a close sympathy between the exterior muscles of the trunk and the internal organs, and that by strengthening these muscles it is possible to invigorate the underlying organs. It is therefore of the greatest importance that the abdominal muscles be developed and that the exterior muscles over the heart and lungs be strengthened through suitable exercise. This, in brief, is the aim of physical culture today, and the exercises shown on the following pages are planned systematically to build up and strengthen the muscles of the trunk.

The exercises prescribed can be taken in your own home, without any ex-

penditure for special clothing or apparatus. It is important that the exercises be taken in a well ventilated room, and that sufficient loose clothing be worn to protect the system from cold. To the beginner a caution is necessary: One unaccustomed to these exercises is very liable to indulge too freely at the start. When this happens, muscular soreness and lameness follow. It is far better to do too little than too much, and the exercise should be continued only long enough to produce mild fatigue, *never to the point of exhaustion*. The amount of exercise should be increased gradually as the strength improves. While the most desirable hours for these exercises are just before retiring at night, or when one rises in the morning, they may be taken at any time if other hours are more convenient.

It is not supposed that one will attempt all of the following exercises at the beginning. Only one or, at the outside, two should be practiced at first. After this, one exercise after another can be added as the strength increases and the system is invigorated. Doubtless but few will care to practice all of the exercises given. Neither is it necessary that they be taken in the order in which they are named; some may prefer to select certain numbers, others another series of numbers. The chief point is that a certain amount of exercise be taken with regularity and that the exercises adopted be such as to bring all the muscles of the trunk into activity.

EXERCISES FOR PRACTICE.

Exercise 1. Lie flat on the back. Raise first one leg and then the other to a perpendicular position. (See Figs. 1 and 2.)

Exercise 2. Raise and lower both legs. Continue until mildly tired. This is an excellent exercise for the abdominal muscles.

Exercise 3. Same position as in Exercise 1. Hands clasped behind the head. Pull up to sitting position. (See Fig. 3.)

Exercise 4. Stand erect, arms outstretched to the side horizontally. Twist to left as far as possible, then twist to the right. (See Fig. 4.)

Exercise 5. Hands on hips. Bend first to right as far as possible. Then repeat to the left. (See Fig. 5.)

Exercise 6. Stretch hands overhead. Bend back as far as possible, repeating until tired. Alternate by bending forward and trying to touch toes. (See Fig. 6.)

Exercise 7. Hands on hips. Twist the trunk around in a circle, first one way, then the other. (See Fig. 7.)

Exercise 8. Hands on hips. Lower the trunk to a squatting position and raise to standing. (See Fig. 8.)

Exercise 9. Tense the muscles of the neck and turn head from side to side, making one set of muscles resist the other in the movement. In the same manner turn the head forward and back and around in a circle, first to the left, then to the right. This is to develop and strengthen the neck. A large neck indicates power. It insures a good blood supply to the brain. (See Fig. 9.)

Exercise 10. Place the palms of the hands together in front of the breast and press hard. (See Fig. 10.)

Exercise 11. Lock the fingers together in front of the chest and pull one hand against the other. (See Fig. 11.)

Exercise 12. Lock the hands behind the back and alternately pull one against the other and push them together. (See Fig. 12.)

Exercise 13. Arms outstretched horizontally. Make the hands describe a full circle forward and back. (See Fig. 13.)

Exercise 14. Place the hands on the floor, the body outstretched, face

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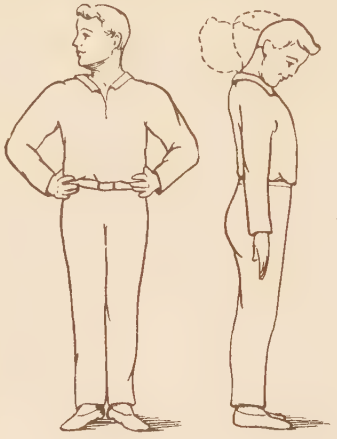

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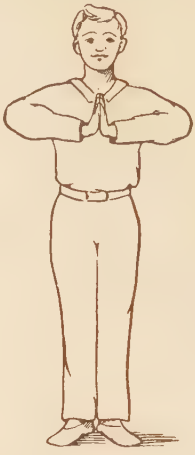

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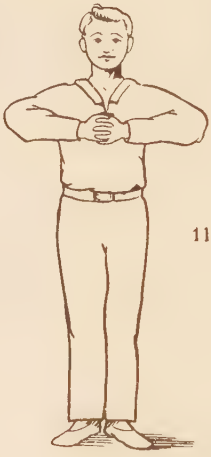

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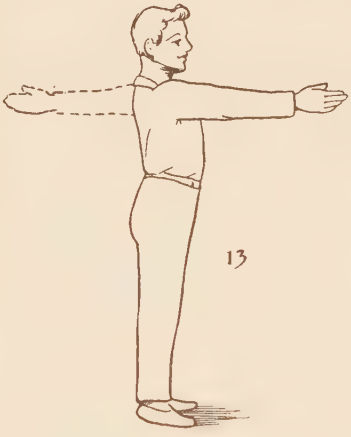

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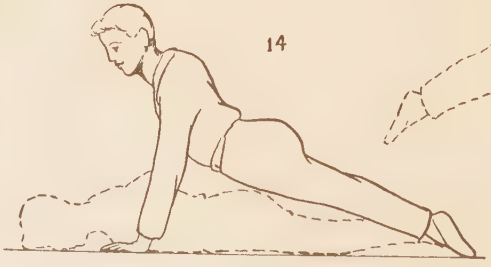

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downward. Raise and lower the body from the floor, dipping the body until the nose touches the floor. (See Fig. 14.)

Exercise 15. Hands on back of a chair or table. Raise and lower the knees rapidly, as in running. (See Fig. 15.)

Caution. It is not intended that all these exercises be taken at any one time. Selections may be made from them according to taste. If the doing of these exercises becomes drudgery to the child, stop a while, but resume them again as soon as possible. Let there be one day in the week of absolute rest.

FOOD.

Food is closely related to health. The quantity and quality of food should be suited to the needs of the individual. This means that it depends very largely upon age, climatic conditions and occupation. In general, one engaged in an occupation which calls for vigorous and prolonged muscular exercise in the open air requires a larger quantity of food and more stimulating food than one engaged in sedentary occupations. There are, however, exceptions to this general rule. These exceptions are very apparent among certain classes of people who take directly opposite views in regard to the value of meat as an article of food. Those known as vegetarians exclude meat from their diet entirely, while we find others who subsist almost wholly upon meats. However, the great majority make use of a mixed diet, in which vegetable foods and meats are mingled in varying proportions.

In the last analysis, the quantity and nature of food depend upon the individual. Neither medical science nor the systematic study of disease have yet been able to disprove the truth of the old adage, "What is one man's meat is another man's poison." In other words, those articles of food which seem to be perfectly adapted to one individual, and by that person easily digested, are to another almost entirely indigestible and cannot be eaten without injury.

Food should be nutritious, readily digestible and free from an excess of condiments or other substances which highly seasoned food contains. For all such substances as need cooking, thorough cooking should be done. In winter one needs more food than in summer, and usually one eats more meat and more fats in winter than in summer because of the heat-producing quality of these substances.

More attention should be given to the manner of eating than is bestowed upon it by a large number of people. All vegetable substances contain more or less starch, and unless starch is digested, it furnishes no nutriment. One should remember that the digestive process of starches begins in the mouth by mingling the saliva with the food. Therefore, food should be thoroughly masticated. One should eat slowly and chew his food until the saliva is thoroughly mingled with it. By doing this the food becomes more thoroughly digestible, furnishes a larger proportion of nutriment, and consequently a less quantity supplies the needs of the system. Those who eat rapidly invariably eat too much and overwork the digestive organs. This practice in the course of time cannot fail to lead to the weakening of these organs and consequent ill health.

Food should be taken at regular intervals. The digestive organs are rhythmic in their action, and when they become accustomed to act at certain intervals, they perform their duties more satisfactorily if this custom is followed. The average adult eats three meals in twenty-four hours; some believe in eating but two. However, if other conditions are equal, the person eating two meals a day will take and assimilate as much food as the one eating three; the first simply eats more at a time. Young children need to eat more frequently than adults, and this need should always be met. However, it should not degenerate

into a habit of constantly eating between meals, after the children have reached such an age that there is no necessity for their eating more frequently than adults. Another very injurious habit which children are sometimes allowed to form is that of constantly munching. This always keeps undigested food in the stomach, tends to overwork that organ and consequently to irritate it.

AIR.

Pure air is as essential as pure food. One can live for hours and even days without food and drink, but one cannot life five minutes without breathing.

We pay too little attention to proper ventilation. Defective ventilation is one of the most prolific sources of tuberculosis and other lung troubles. The home, and especially the sleeping rooms in the home, should be thoroughly ventilated. People are recognizing the importance of pure air, and in most modern dwellings good systems of ventilation are provided. However, in many of the older houses these are either defective or wholly wanting. In such cases, care should be taken to let in air from the outside at frequent intervals. One should remember that cold air is not necessarily pure air, and a room whose temperature is below freezing may, from this point of view, need ventilation as much, or even more, than one which has a temperature of 70°. Schoolrooms and all other public buildings should be thoroughly ventilated every time they are vacated. At each recess the doors and windows of the schoolroom should be thrown open, even in cold weather, for a few minutes, to let the foul air escape and pure air enter. This should be done even when the building is provided with a good system of ventilation, for no system provides a sufficient circulation to remove all the foul air and provide each occupant with all the fresh air necessary.

Breathing exercises in the open air, except in cold weather, are very beneficial and strengthening. In taking these exercises one should stand erect, with hands on hips and head thrown back a little. Air should be inhaled slowly until the lungs are filled to the utmost capacity, then the air should be expelled from the lungs as completely as possible. Exhalation may be slow or rapid, or the slow and rapid movements may alternate. The same effect is secured by practicing these exercises in a room with windows open so as to give as full a circulation of air as is obtained out of doors. In all cases the air should be inhaled through the nostrils.

Breathing exercises are beneficial to everyone, but they are necessary to the maintenance of health for those who are engaged in sedentary occupations. In such cases breathing exercises should be taken at least twice a day—morning and evening. These more formal exercises can be supplemented by an occasional full breath taken while at work. Let the worker pause for a moment, throw the head and shoulders back and inflate the lungs to their full capacity. This secures relaxation of nerves and muscles, and helps invigorate the blood.

In the beginning breathing exercises, like muscular exercises, should be taken lightly, for they can cause more or less of a strain upon the system. As one becomes accustomed to them, they can be increased in length and vigor. But if indulged in too freely at first, they are liable to result in injury.

Games and Plays

JESSIE ELIZABETH BLACK.

Value in Play.

The educational world is beginning to recognize the importance of play in the development of child's character, and many public school systems make provision for games and plays in their course of study. Large cities are not only establishing playgrounds at public expense, but are also providing attendants who can teach the children interesting and healthful games. The suggestions here given are for the purpose of assisting teachers and parents who wish to teach the children under their charge to play in the right way.

"Play is not trivial; it is highly serious and with deep meaning," says Froebel. Play is one of the ways in which the child expresses himself. Games furnish one of the means of securing at least part of the development stated in the educational ideal—"a healthy mind in a healthy body." Games aid in the cultivation of social and of competitive activity; they afford an opportunity for ethical training.

The play time furnishes an opportunity of so refreshing the body and mind, stiffened or fatigued from close application to work, that the work itself will be more advantageously pursued, and the time used in exercise more than made up because of renewed interest and attention. Because little children become easily fatigued, frequent brief play periods should be provided for, rather than one long one.

Aims.

This work in physical training must be:

(1) Hygienic, adding to the health of the child through its good effects on circulation, respiration, etc.

(2) Corrective, tending to correct the defects in posture and movement caused by stooping over desks, etc.

(3) Educative, training the brain, nerves, and muscles to alert, controlled action: the harmonious working of body and mind.

(4) Recreative, furnishing relaxation, fun, joy, all of which increase the value of the work for the pupil.

Now every game cannot have all these four values. The game, the aim of which is educative, as ring toss, which requires precision of movement and quick response of the body to the mind, should be played often, but not to the exclusion of others whose main aim is, let us say, hygienic, as racing, which gives a healthy stimulus to the circulation and respiration. Vary your games.

SOME SIMPLE, PRACTICAL SUGGESTIONS.

Do not waste the short play time in making elaborate plans about what is to be played; get right to business and keep things moving.

During the game period, throw open the windows so that the air may be completely changed.

Let the teacher enter into the spirit of the play, making it a period, to an extent, of recreation to herself. She needs it.

Encourage the children to get into the habit of taking deep, full breaths to "wash out" the lungs. Tell them to take three such breaths every time they step out of a door into the air.

The best method of teaching a game is to make a full explanation of it before the pupils take their places to play. Never try to teach and play a game at the same time.

As a rule let the children choose the games. Encourage "team" work, trying with all their might to win for their side.

Insist on holding to the simple rules of the game—to the honest winning or losing of a game.

GAMES FOR YOUNG CHILDREN.

In the Schoolroom or the Home.

I Saw. A child in each row tells of some action he has seen, as a duck flying, a soldier marching, or a train speeding, at the same time illustrating it. Each row in turn follows its leader around the room, imitating the action shown.

Express Train. Children are chosen for engine, headlight, bell, wheels, conductor, passengers, etc., and run in a row up and down the aisles, executing the action appropriate to each part. "Train is stopping!" calls the teacher. It comes to a standstill, children take their seats, and another train is "made up."

Squirrel Game. The children blind their eyes with heads upon their desks, and one hand open, in the hope of getting a nut which one child, the "squirrel," may drop into it. The child who receives the nut runs on tip-toe after the squirrel and tries to catch him before he reaches his seat. If he does not, then he is "squirrel."

Hole in the Ice. The "hole" or "crack" in the ice is represented by two chalk lines on the floor. One row of children at a time runs or jumps, in turn, trying to jump over the "hole." If any one touches the floor between the lines, instead of going home to his seat, he must first come to the front of the room, while the other rows are jumping, and dry his feet by running on tip-toe "on place." The width of the "crack" may be gradually increased. This game is good for circulation and respiration.

Follow the Leader. A competent child leads the class around the room, up and down the aisles, skipping, then waving, stepping high like a horse, clapping, etc., changing quickly from one to another. The other children imitate. This and the following are excellent for brief recreative exercise.

Review Roundel. (This may be sung to the tune *Yankee Doodle.*)

"There you stand before us all
To teach us what to do, sir!
Now show a motion you recall
And we will follow you, sir!"

The pupils should stand at their desks or in a circle. The pupil chosen for "teacher" stands in front. The pupils march forward on lines 1 and 3, and backward to place on lines 2 and 4, singing as they step. At the close of the song, the "teacher" shows a favorite exercise, as sawing wood, touching the floor with the finger tips with knees sprung back, etc. The rest of the class imitate it. "Teacher" may mark the rhythm by singing *la* to *Yankee Doodle* tune, as the pupils take the exercise. This game gives all a little exercise at once.

Bean Bag Games. The following games can be played with bean bags about 5 inches by 5 inches made by the children (a set of these should be in every school-

room for games), or with a large, light rubber ball. Some games can be played out of doors.

The teacher may open the game as follows: As many pupils as possible may take places on a chalk circle drawn on the floor in the front of the room, or where there is a vacant space.

The pupil who is "it" or "teacher" tosses the bag to any pupil in the circle, who becomes "teacher" if he catches the bag, or must take his seat if he does not. The pupils for whom there was not room at first, may fill vacant spaces. The game may be varied by the "teacher" tossing the bag in the air and calling the name of a child, who becomes teacher if he jumps forward and catches it, or takes his seat if he does not. This latter variation of the game should be played very quickly.

Cat-Stitch. Number the rows or aisles of children, 1, 2, 3, 4, etc. The pupils should stand, each even row facing the nearest odd row. The first pupil in the even row tosses the bag to the second pupil in the odd file, the bag continuing in a zigzag course to the last pupil, who tosses it directly across, so that after returning in a zigzag course, the first pupil in the odd row will have the bag. Count may be kept to see which double row finishes, without dropping the bag, first. Allow laughter, but insist on attention.

Touch Ball. The ball or bag is passed rapidly from one to another of those forming the circle, high or low, across the circle, or in any direction stated by the teacher. A player, or "it," in the center, tries to touch the ball or bag, and changes places, when successful, with the one who had it when it was touched.

Out of Doors.

Play out of doors when possible. Some of the following games may be played indoors, if space permits, in stormy weather.

Cat and Mouse. The players form a circle, grasping each other's hands and standing about an arm's length apart. The cat stands outside the circle; the mouse to be caught stands inside. The pupils forming the circle may favor one or the other by raising arms to allow passing in and out of the circle, or may lower arms to prevent it. As soon as the mouse is caught, other players are chosen.

Hawk and Hen. About ten or twelve children stand, one behind another, with their hands on the shoulders of the player in front, and represent hens. Another player, the hawk, tries to catch the last hen in the line, and the first hen tries to prevent this by getting in front of him, and by raising arms, etc., while the rest try to keep out of the way of the hawk. As soon as a hen is caught, she is out of the game. Choose an alert mother hen to head the line.

Moon and Morning Stars. This Game is played when the sun is shining. One of the players is the moon and takes her place in the shadow of the schoolhouse, a tree, etc. She must not go into the sunshine. The other players, the morning stars, dance from the sunshine into the shadow near the moon, calling:

"O the Moon and the Morning Stars!
O the Moon and the Morning Stars!
Who will step—Oh,
Within the shadow?"

The moon tries to tag the stars and they may either be kept with her or change places with her, as the players decide.

Dare Base. A line is drawn midway between the goals. A catcher stands at each end of this line. The other players run back and forth between the goals; they may not be tagged when in the goals or on the base line, but they may

not pass back to the goal from which they started until they have gained the opposite goal. Those who are caught are put out of the game, or they may be made catchers.

Black Man. One is counted out as Black Man. The rest come round, crying, "Who is afraid of the Black Man?" Suddenly the Black Man begins to chase. When one is caught, he is Black Man, or else he may be the Black Man's Helper. The game closes when all are caught. Bounds must be set beyond which no one may run.

Frog in the Middle. Any number may play this. One player is chosen for "frog" and sits in the center with his feet crossed. The other players stand in a circle around the frog, repeating, "Frog in the middle can't catch me!" They dance forward toward the frog and back, taking risks in going close. He must keep his position while trying to tag his tantalizers. The one tagged is frog.

Other Games. Among other games suggested for young children are the following: Mulberry Bush, Farmer in the Dell, Jacob and Rachel, Oats, Peas, Beans, Drop the Handkerchief, London Bridge, Hopping, Three-Legged and Backward Races, Stoop Tag, Wood Tag, Pussy Wants a Corner, Bean Bag Throw, Itisket-Itasket, Shadow Tag, Follow Chase. Most of these one child or another will recognize by name and will gladly lead.

GAMES FOR OLDER CHILDREN.

In the Schoolroom or the Home.

Many of the games suggested for young children remain favorites and may be continued as the children grow older. As children grow older they enjoy the "team" element in games and are more anxious for their side to win than are the young children, who love more the mere activity of the game. Races, especially relay races of all sorts, appeal, therefore, to older children.

Bean Bag Race. Bean bags, books, erasers, or wands are held above the heads by pupils seated in the front seats. All the children sit erect with arms raised overhead. At command the bags are passed backwards above heads by pupils until the last pupils are reached. These pass them forward in the same manner. The pupil in front first receiving the bag rises to show which row has won. Allow the enthusiasm free expression in this most valuable game.

First In, First Out. A group of three erasers, or bean bags, etc., is placed in a chalk-marked square on the floor in front of alternate rows. The players, beginning with the pupils in the front seats of these alternate rows, take the objects one at a time from the square and place them in a similar square at the back, running down one aisle and returning by the other. When all are gathered, they are returned in the same manner, and the pupils in the second seats, without pause, continue the game. The row whose pupils finish first indicate it by clapping. This game is full of fun and excitement and a great outlet for the repressed energy of the child from ten to fourteen.

The same rules apply to the game of running to touch front and back wall in succession, and then taking the seat, which can be played when time is very limited and relaxation for all is desired.

Running Relay. The room may choose sides to last for a week. These sides may stand in close rows in the two center aisles, leaving aisles for runners at each side. Each leader has one bean bag. At the teacher's word "Go," the bag is passed rapidly down the line. The last pupil runs to the head of the aisle with it and the passing continues, the line gradually moving down as the children come to the head. This lasts until the first player is in his position again as leader. The side whose leader is first in place indicates winning by clapping.

Tossing Tally. Let pupils, one from each row in turn, stand at a given distance from a slanted board, two by three feet, with an opening eight inches square in the center, and throw bean bags. Bags passing through the center score ten points; those landing on the top of the board score five points, and those landing on the floor diminish the score by five points. Bags displaced count for the rows by which they are displaced. The score should be 100.

Out of Doors.

Three Deep. The players form a double circle, one within the other. The distance between the players must be two steps. One player stands directly behind another. There are two "its," one trying to tag the other as he runs around the outer circle. Just as he is about to be tagged, the runner quickly moves to the inside in front of a pair of players (making "three deep"), and then the last, or outside player, must run. If the tagger succeeds in touching the runner before he jumps inside, they reverse the running, the one who has tagged trying to get in front of a pair at once. The children should never run across the circle or between circles to reach inside. This game is a particular favorite with older children, and makes for alertness as well as for general physical development.

Fire on the Mountains. Places are marked in a circle by sticks or stones, with considerable space between, providing for two less spaces than there are players. One of the odd players is a leader, and sits or stands in the center; the remainder, or "circle men," take the places marked. The other odd man stands anywhere between the bases or marked places. The object of the game is for the "circle men" to change places on a signal from the leader, each player trying to avoid being the odd man by losing a place. The longer the distance between the bases, the better the sport. The running must be done in a circle outside of the bases and no cross cuts through the circle are allowed. The player in the center calls:

"Fire on the mountain, run, boys, run!
You with the red coat, you with the gun;
Fire on the mountain, run, boys, run!
Base!"

Then the changes must be made, the center man and the other odd man trying to get a base. Those left out are the "its" as the game continues. Forfeits may be used in this game.

Last Couple Out. This game requires an odd number of players. One is chosen for catcher, who stands with his back to the rest, not less than ten feet in front of the rest of the players. The rest of the players stand in couples in a long line behind him, facing in the same direction that he does. The catcher calls, "Last couple out!" Then the last couple in the line runs toward the front, the right-hand one on the right side of the double line, and the left-hand one on the left side, and try to join hands in front of the catcher. The catcher must not chase them before they are in line with him, and must not turn his head to see them as they come. They should try to confuse him by circling far out beyond him on either side, or by one keeping close and the other circling out, etc. If the catcher succeeds in catching one of the players before that player can clasp hands with his partner, these two, catcher and caught, form a couple at the head of the line, which moves back a step. If neither is caught they are free, or out of the game.

Trade Game. A few players step aside and decide on some trade to represent. They advance to the others, saying: "Here we come!" The others respond, "Where from?" "New York," they reply. "What's your trade?" The few then

show in pantomime some trade, either all taking the same action, or various actions used in the occupation chosen. The first one to guess the trade chases the players, trying to tag those desired for the next trade game, which the guesser promptly gathers a few players to decide upon. This is one of the most valuable of the "guess-action" games, which the teacher can vary to suit the needs of the school.

Other Games. Among other games suggested for older children are the following: Potato Relay Race, Black Tom, Hound and Rabbit, Prisoner's Base, Indian Club Race, Vaulting Relay, Fox and Geese, Tug of War, Poison Snake, and Medicine Ball. Most of these the children will recognize by name. Discussion of the rules in school helps greatly when the games are played.

QUIET GAMES.

The following quiet games, with fewer physical values, are yet of great value for recreation and for mental training.

Magic Music. An object is hidden after one child has been sent from the room. Upon his return, those in the room help him to find it by humming a familiar tune or by clapping, softly at first, but loudly as he nears the hidden object. This is good for ear training and motor control.

Beast, Bird or Fish. One child comes to the front of the class and says: "Beast, bird, or fish!—Bird! Martha!" Before the child in front counts to ten, Martha, or whoever is chosen, must call out the name of a bird or else come to the front. Beast and fish are called in the same way.

Horns Up. Hands should be placed with thumbs up, as in "Simon Says Thumbs Up." The leader calls: "All horns up!" "Dog's horn up!" or "Cow's horn up!" As he speaks, he lifts his own thumb up. When he names an animal that really has horns, all players lift their thumbs; when he names one that has no horns, any player that points his thumb up is out of the game.

My Thought. Teacher: I'm thinking of a word that rhymes with "pat."
Pupil: Is it what you wipe your feet on?
Teacher: No, it isn't "mat."
Pupil: Is it an animal that catches mice?
Teacher No, it isn't "cat."
Pupil: Do you play ball with it?
Teacher: Yes, it is a "bat."

The same guessing idea may be carried out by sending out one child while the rest choose an object in the room, and then giving the child the right to ask ten questions of the pupils, in his attempt to guess the object. His first questions should determine whether it is animal, vegetable or mineral.

Guess Again. The teacher has sets of cards in Geography, History, etc., on which she has written the principal seas, cities, productions or the like, already learned by the children. She picks up one card at random on which may be written *Pacific Ocean*, and calls, "An ocean! P." Before the teacher can count ten, the child she calls upon must name an ocean beginning with the letter P. There are many variations of this review game which will suggest themselves to the teacher.

Acting Charades. Children heartily enjoy "making up" plays, as in acting charades. Sides are chosen and each side in turn selects some word to be guessed by the other side. For instance, if *Washington* is chosen, it may be divided into "washing" and "ton." The act of washing may be represented, and then the act of weighing, after the explanation has been made that it is a proper noun of three syllables to be played in two acts. This game, too, is capable of great range, and cultivates great ingenuity on the part of the children.

Ethics

INTRODUCTION.

The article *Ethics* in THE NEW PRACTICAL REFERENCE LIBRARY tells what ethics is and also states some of the leading views concerning ethical theories. The importance and practical value of this subject are too often overlooked, most people considering ethics to be an abstract science in which only theologians and professors of philosophy in colleges and universities are interested. Such a view is far from correct, for the proper development of his moral nature early in life is of the greatest importance to everyone. Much of the irresponsibility, deception, dishonesty in public and private life, and the gossip so detrimental to society, is due to the lack of moral training in early life on the part of those who engage in these practices.

While moral training has always been important, it is especially so at the present time, for the following reasons:

1. In a democracy such as ours, the laws of the state and the nation derive their authority from the consent of the governed. The strongest safeguard against lawlessness and the enactment of vicious laws is a public moral sentiment which will not tolerate the one nor support the other.

2. Our present industrial system separates employer from employe, parents from children; creates classes in society, and makes practically impossible the old-fashioned home with its benign and sacred influences. Unless special emphasis is placed upon moral training during childhood, the public standard of morals will be lowered.

3. Our complex life tends to a confusion of moral ideas on the part of some. There are altogether too many men who possess a "stratified conscience;" that is, they have one conscience for their home life, another for their church life, a third for their social life, and a fourth for business. "Mr. A is the soul of honor in his private life, but in business he is not to be trusted," says one. "Mr. B. is a very faithful attendant upon the services of his church on Sunday, but look out for him on the other days of the week," says another. Unfortunately, the conditions here described are so numerous as to make the above examples commonplace. We say that a person following different moral standards lacks principle, and this is true; but he lacks as well a moral training which would have given him a clear conception of right and wrong and developed in him the power of deciding for and adhering to the right.

Recognizing the importance of moral training, the publishers of the EDUCATOR call attention to the very helpful matter found on the pages which follow. The principles stated are fundamental, and the purpose of the article is to show parents and teachers how they can aid those under their charge in gaining high ideals of right and in forming the habit of following those ideals. The following outline will assist in the study of the article:

RIGHT AND WRONG.

Impulse.
Moral Acts.
- Immoral Acts.
- Non-Moral Acts.

What a Moral Act Includes.
- Knowledge.
- Desire.
- Choice.
- Execution.

Ideals.
- Heredity.
- Early Training.
- Public Opinion.
- Associates.

Change of Ideals.
Moral Standards.

HELPFUL SUGGESTIONS.

- Environment.
- Mental Attitude.
- Example.
- Books.
- Self-Restraint.
- Self-Reliance.
- Reason and Judgment.

QUESTIONS FOR DISCUSSION.

Maxims for Memorizing.

Right and Wrong

Impulse. Every idea has in it what may be called an impulsive element, that is, as soon as the idea is entertained there comes along with it a tendency to carry it out in action. In children, and in some people of mature years as well, this element is so strong that it leads to immediate execution of the idea regardless of the consequences. People in whom this element is strongly developed are called impulsive. If their acts are disastrous either to themselves or to others, and they are asked why they do such things, the usual reply is, "Oh, I did it before I thought," or "I didn't think."

The thoughtful man is inclined to censure impulsive people, but he should not condemn impulse, for in impulse lie the beginnings of action. The impulsive or motor element in ideas should be brought under the control of the will and be guided by reason. In this way it will be led to manifest itself in acts that are beneficial to the individual and helpful to those with whom we associate. In brief, impulse properly guided leads to right action. Without guidance it is liable to lead to wrong action. One of the first steps in moral training consists, therefore, in helping the child to gain control over his impulses.

The child is particularly a creature of impulse; the reason and the will develop slowly, and for the first ten or twelve years of his life the child is moved to action more by his feelings than by any other power. Parents and teachers who understand the training of children recognize this condition and endeavor to keep the children under their charge in a happy frame of mind. In a state of happiness the desirable emotions are active, and these in turn lead the child to right action in his relation to others.

Moral Acts. What is a moral act? Do all acts contain a moral quality? While there may be some differences of opinion upon these questions, it is generally accepted that moral acts are those which are concerned with our relation to others, or with the development of our own character. For instance, casting one's vote is a moral act. In his vote the citizen registers his choice for officials to administer the law or for measures which affect the welfare of the state or community. His

choice affects not only himself but those with whom he is associated. Again, a boy's obedience to rightful authority, as a request or a command of his father or mother or his teacher, is a moral act. It shows that he recognizes and conforms to the proper relation which he sustains to the one making the request or giving the command.

Acts relating to the development of our own character cannot be wholly separated from acts relating to others. What we are determines what we do. On the other hand, what we do helps to make us what we are. A good illustration of this class of acts is found in those acts which are concerned with the formation of personal habits, such as truthfulness, honesty and the like.

Immoral Acts. Acts which are contrary to the welfare of society and of the individual are immoral. Indulgence in an appetite for intoxicants is immoral because their effect is injurious both to body and mind. Appropriating that which belongs to another without his consent, or without giving him an equivalent in return, is immoral. Deception in any form is immoral, and to the above list many other illustrations can be added by the reader.

Non-Moral Acts. A non-moral act is one which sustains no relation to others and will have no specific effect upon one's character. Such, for instance, is the swinging of the arm when walking; multiplying one number by another simply for the multiplication or when there is nothing depending upon the result. In the discussion of morality non-moral acts are usually given little or no consideration.

What a Moral Act Includes. A complete moral act brings into play all the mental powers. It consists of the following steps:

1. *Knowledge.* You must know whether the contemplated act is right or wrong before you can determine its moral quality.
2. *Desire.* The knowledge gained leads to a desire to perform the act.
3. *Choice.* Knowledge and desire lead to decision. You choose to do or not to do.
4. *Execution.* Having made the choice, you proceed to carry it out in action. The act is performed or it is dismissed from the mind.

A concrete illustration will enable us to fix these steps more clearly in mind. Henry, a boy of twelve, started for school one morning in time to enable him to walk the mile between his home and the schoolhouse and be in his seat when school called. Before he was half-way there he discovered a neighbor's colt so entangled in a wire fence that the animal was liable to serious injury unless released at once. Upon examination Henry found that unaided he could not release the colt. He saw that the colt was in danger (knowledge); he therefore wished to release it (desire), but if he went for help he must be late at school. Which should he do—go for help or go on to school? He decided to return home and get help (choice). He no sooner reached this decision than he started for home (action).

The reader will be interested, possibly, in analyzing a number of his own acts after this plan. In the study of the illustration, or in the analysis of his own acts, however, the reader should bear in mind that the last step is the crowning achievement, and that unless this step is taken, the others are of no value. Many a young man can trace the beginning of his downfall to his failure to act upon the good resolutions he made.

Ideals. Though we may understand that a moral act is a right act, it is not always easy to decide whether an act is right or wrong. Such is the difference of opinion, that the same act is often considered right by one and wrong by another. The questions "What is right?" "What ideals shall I follow?" and "What ideals shall I lead those under my charge to follow?" are constantly before

the conscientious parent and teacher. If we would lead those having less experience than ourselves in the paths of right, we must first of all be familiar with those paths ourselves. Our ideas of right and the ideals that we form are shaped by a number of influences; chief among them are the following:

Heredity. Everyone is born with certain inherited tendencies. These become more or less prominent in childhood and exert an influence over one's entire life. These tendencies may be beneficial or injurious. They are modified to a greater or less extent by environment and training. If given proper attention in childhood, inherited tendencies can usually be brought under the control of the will. Those which are undesirable should be suppressed, and those which are beneficial should be strengthened. Many people assign to heredity a much larger share of responsibility in the development of character than justly belongs to it.

Early Training. We never wholly depart from the teaching of the first ten years of our lives. The ideas of right and wrong received during these years abide to a greater or less extent in our moral consciousness. The early moral training, both direct and indirect, which a child receives is therefore of the greatest importance.

Thomas lives in a home whose inmates are kind and courteous to each other, and whose atmosphere is pleasant. He is taught to be kind, truthful and generous. By the time he is ten years of age he has learned that these virtues are right and that their opposites are wrong. Andrew lives in a home where there is constant strife; the inmates exercise their ingenuity in deceiving each other and in trying to gain some advantage over their associates. To Andrew lying and selfishness are virtues, and truthfulness and generosity are weaknesses practised only by those who have not sufficient courage to withstand their fellows. These boys go out into life with directly opposite moral ideas as the result of their home training. Between these extremes are many grades of moral code, each formed by home training and association.

Public Opinion. Every social group, whether of children or adults, has its moral code, and failure to conform to this code is a cause for disapproval if not for censure and expulsion. This code expresses the moral sentiment of the group, be it large or small, and this is what we usually mean when we speak of public opinion. It requires courage to stand against public opinion. Let Thomas remove to a locality where the most of his boy associates are of Andrew's type, and he can remain true to his moral code only by constant struggle and possibly an occasional fight. If Thomas is a lad of weak will, he will soon yield to his companions and adopt, with possibly some mental reservation, a good portion of their moral code.

The case of Thomas is that of a large number of people of older growth. When moving from one locality to another they often find themselves at variance with the community they have entered. What shall they do? Shall they adhere rigidly to their established moral code and be looked upon as "queer," "Puritanic," and so on, or shall they overlook these points of difference and conform to the usages of society? These are among the most important questions that ever confront a young man or a young woman upon leaving home, and their decision often marks the turning point in the person's life.

A young person of good moral training and strong will will not give up those moral principles upon which his character is founded. Furthermore, he will adhere to such virtues as truthfulness, honesty, sobriety and industry. However, if one's moral convictions are not firmly fixed, one is very liable to change one's moral standard, because in so doing the individual follows the line of least resistance.

Earnest people who believe the moral code of society to be partially wrong

refuse to conform to those beliefs and practices which their conscience will not approve. Such people are staunch moralists, and although the thoughtless may deride them, their influence in a community is always good. In time this influence usually wholly changes or in part modifies the objectionable practices. The reformer not only refuses to adopt the moral code of society, but he openly and aggressively goes to work to change public opinion until it shall coincide with his views.

Associates. One's ideas of right are more or less influenced by the opinions of those with whom one comes in daily contact and by the opinion of intimate friends. When two people are associated, the stronger influences the weaker and the result is a modification of ideas. This influence is much stronger with children and young people than with those of more extended experience. We can, therefore, see the necessity of safeguarding the young from evil associates. The saying of the wise man, "Keep thy heart with all diligence, for out of it are the issues of life," is as potent now as when it was uttered three thousand years ago.

Change of Ideals. To the active mind the ideal of today is different from that of yesterday. Every day sees advancement; the man's view of moral truth is broader and his insight into moral principles deeper. This growth does not necessarily imply the forsaking of old principles and the adoption of new ones. It is more likely to mean the discovery of new opportunities of applying these principles, and with each new application the strength and significance of the principles are increased. In this way our moral ideas expand. Men and nations regard each other with greater respect and kindlier feelings today than they did a century ago. The ideal hero of the fifteenth and sixteenth centuries was the warrior; the ideal hero of the twentieth century is the man who can prevent war. Ex-President Roosevelt gained greater renown by bringing about the treaty which closed the Russo-Japanese War than any military or naval commander in that conflict. This is also true in local communities; the man who is held in highest esteem is he who uses his talent in promoting the peace and welfare of the community.

Again, the true boy hero of today is not the bully of the playground but the boy with the moral courage that enables him to stand by what he knows to be true and right, and thereby promote a public sentiment which drives the bully to cover.

Breadth of view leads to tolerance. Many pastimes and pleasures that were formerly considered harmful and even sinful, are now accepted and indulged in as being beneficial. People of experience are more lenient toward young offenders than are those of their own age. These facts do not imply that moral principles have been discarded, but that they are more broadly applied.

Moral Standards. From the foregoing discussion we see that moral questions are often complex and that even the man of education and experience occasionally finds it difficult to decide what is right in certain cases. This is true to a much greater extent of those who lack training and experience. For these reasons moral standards should be established, and those virtues which for ages have been recognized as right by all civilized peoples, should become firmly fixed during the periods of childhood and youth. The most important of these virtues are truthfulness, honesty, fidelity, reverence, sobriety and kindness. However widely people may differ in their application of these virtues, they are universally recognized as constituting the foundation of all good character, and their installation should be the chief aim of moral instruction. Teachers and parents will be aided in this work by giving attention to the points mentioned under the following title:

Environment. The body exerts a strong influence over the mind. While now and then we find a brilliant intellect associated with a weak and sickly body, in general, health and vigor of the body lead to a clear intellect and a clear conscience. The surroundings of children should be pleasant and of such nature as to give them the bodily comfort necessary to a happy frame of mind. Plain, nourishing food and loose, comfortable clothing are important factors in moral training. Children who live in the country have greater advantages for the development of character than many of those who live in the city. The country child communes with nature and learns many of her secrets. For a portion of the time, at least, his companions are birds, insects, animals, trees, flowers, verdant hills and running brooks. The city child may be confined to streets and alleys for his playgrounds and may have vicious companions only for his associates.

Whether in city or country the home life should be made attractive. There should be no place where the child can find so much pleasure and enjoyment as at home. An atmosphere of love and kindness should pervade the home, and through his association with the other inmates, as well as by precept and example, the child should be led to practice the virtues we have named.

Mental Attitude. The mental attitude exerts a strong influence upon character. The child who is always happy is kind, truthful and honest. His desirable feelings are constantly active and they give little or no opportunity for fear, anger, hatred and other undesirable emotions to appear. Teasing, nagging and scolding by those who have the care of children are reprehensible, and their practice is a serious obstruction to the development of right character.

Example. In nothing is the adage "Example is better than precept" more clearly proven than in moral training. Children are imitators and they strive to become like those whom they love. By the time he is ten every boy has a pattern that he is following. This pattern may be a living personality or it may be the hero of some tale. Parents and teachers should not only do what they wish their children to do, but it is equally or more important that they refrain from doing those things which they do not wish their children to imitate.

Books. A word should be said about the value of reading as an agency in the formation of character. Next to friends and associates, books exert the greatest influence over the young. A story like Ruskin's *King of the Golden River,* Hawthorne's *Great Stone Face,* Longfellow's *Evangeline* and scores of others that might be named, whether in prose or verse, will do more toward the development of character than any number of discourses on duty, honesty or other virtues. Many maxims gleaned from books when memorized are also helpful and often inspiring.

Fortunately, school and other public libraries are now so common, and good books can be procured at such slight expense, that suitable reading can be placed in the hands of all. Just here a word of caution may not be out of place. The young should be safeguarded from vicious literature as carefully as from evil associates. Both exert a baneful influence. Inhibition, or the power to arrest a previous action, is the highest prerogative of the will. The wise use of this power shows that the will has been well trained.

Self Restraint. Thrice armed against evil is that young person who during childhood learned to say no and to stand by it. In the development of character restraint is as essential as action. One is led astray by first consenting to little things which are wrong. One step leads to another, and thus the character is lowered. Resistance to temptation must be acquired in the home if it is to be acquired at all.

Self Reliance. In the formation of character it is necessary for the youth to learn to rely upon himself. In order that he may do this he must recognize his own powers and believe in them. Those who are unable to stand alone are easily led into temptation. From the beginning the child should be trained to do all that he can for himself. Too many parents and teachers do far too much for the children under their care. The maxim "Never do for the child what he can do for himself" may occasionally be taken too literally and cause waste of time and energy, but in general it is a safe maxim to follow. Within the capacity of his judgment the child should be led to decide moral questions for himself. Muscle, intellect and conscience gain strength only through exercise.

Reason and Judgment. We have seen that many moral questions are complex, and that often a right decision can be reached only through a careful investigation of all the circumstances involved. Questions of this kind can be decided only by those who can think clearly and exercise sound judgment. The thought powers develop later than the powers of observation and memory, hence young children can do but little reasoning and should not be asked to decide complex questions. During the period of youth, however, the thought-powers should receive particular attention. By discussion, illustration and experience, young people should be led to realize that hasty judgment is faulty judgment. Exercises for training the reason should not be confined to problems in arithmetic and grammar; the affairs of everyday life furnish many interesting and profitable problems for consideration.

QUESTIONS FOR DISCUSSION

The following questions are given as illustrations of what may be done in the home, the school or in clubs and other organizations to train one to reason along ethical lines. Some of the questions are very simple, while others are so complicated that they will tax the ingenuity of the keenest intellects. In every case the reasons for the decision should be given.

The discussion of two of these questions given below shows how they may be used. Considerable amusement can be derived from questions of this nature, whether in the home or school, or wherever any number of people are gathered. The discussions which are sure to follow their introduction serve the double purpose of training the reasoning powers and of showing those taking part the necessity of considering all the evidence in a case before a just decision can be reached.

At the close of school someone took Lucy's umbrella by mistake. Lucy remained to do some extra work, and when ready to depart she found only one umbrella. It was raining and she must take this umbrella or be exposed to the storm. On the way home she broke the umbrella. The next morning it was learned that the umbrella belonged to Fred. Who should pay for mending the umbrella?

"Lucy, of course," says Tom. "She broke it."

"Fred," says Nellie. "Boys, not girls, are always expected to pay such bills."

"Whoever took Lucy's umbrella," says Henry. "That person was responsible, for he made the mistake."

Are any of these answers right? If so, which one?

On examining Tom's answer we find that Lucy was obliged to use the umbrella as a means of defense against a boy who did not attend school and that it was in so doing that she broke the umbrella. The accident resulted from necessity, not carelessness.

We see at once that Nellie's answer is founded on sentiment, rather than

justice. In discussing this answer George remarks that girls and women nowadays are trying to take the places of boys and men in almost all kinds of work, and if they want to do men's work he doesn't see why they should not take men's responsibilities.

Henry passes by those directly connected with the affair and strikes at the original cause; but no one is willing to own up to taking Lucy's umbrella.

Under the circumstances, who should pay for mending the umbrella?

Tom Brown on his way to high school one morning found a lady who had been run over and dangerously wounded. Tom saw that unless the lady received medical assistance at once she would die from loss of blood. A delivery team was standing near by and Tom lifted the lady into the wagon and drove rapidly to the hospital. He was so intent upon securing assistance for the lady that he did not stop to hitch the horse, and while they were carrying the patient into the hospital, Henry Adams came along and waved an umbrella at the horse, frightening it so that it ran away. The wagon was broken, a little girl was run over and seriously injured and the horse was killed. Who should pay the damages?

"Tom's father," says A.

"Henry's father," says B.

"The lady's husband," says C.

"The one who was responsible for the injury to the lady," says D.

Let us consider each of these answers in the light of the circumstances connected with the case.

A makes Tom's father responsible because he claims that in taking the team Tom did what he had no right to do, and in leaving the horse unhitched he was grossly careless. But A overlooks the fact that Tom was saving a life, and that this was of more importance than anything else connected with the affair.

B places the responsibility upon Henry's father, alleging that had Henry not frightened the horse, all would have been well. But Mr. Adams claims that Henry was a lad of seven and too young to realize the possible consequences of his act. He did not intend to frighten the horse; he was only interested in the peculiar way in which the horse looked at the umbrella.

C would throw the burden upon the lady's husband because he claims that the husband should be willing and glad to pay any cost which resulted in saving his wife's life. But the lady was a widow; therefore some other source of payment must be found.

D passes over all those immediately connected with the affair and places the responsibility upon the one who injured the lady. However, no one knows who he is.

The little girl's father had a heavy doctor's bill to pay, and the grocery firm lost their team. From whom are they entitled to collect damages?

Two Government officers are sent to the Yosemite with a large sum of money. As they drive round a corner in a rough part of the country, two highwaymen spring out and yell "Hands up!" The officers at once obeyed? Did they do right?"

Factories sell their typewriters to teachers for $70, but the price to other people is $100. Your principal buys a machine for $70 and decides in a few days that he does not care for it and offers to sell it to a lawyer. What should he ask the lawyer for it? Should the teacher or principal ask permission of the firm to sell the typewriter for less than $100?

Tom saw Fred cheating in an examination. After it was over Tom said to Fred, "You are a good friend of mine but your cheating in the examination was wrong in four ways." What do you think were the four ways that Tom had in mind?

Henry is trying to decide whether or not he ought to go to college. He is talented but poor; his father is dead and his mother is not strong. How ought Henry to decide the matter?

Dick and Keran are in the same room at school. Dick gets mad at the teacher one day, and that evening when the two boys are going past the schoolhouse, Dick has revenge on the teacher by throwing a snowball through the window in the schoolhouse. Keran saw him do it. The next day the schoolteacher asks each boy in the school privately what he knew about it. What should Keran say when she asked him?

A boy goes to spend the night with his friend, another boy about the same age. The boys' room is lighted by a defective lamp. In the night the visiting boy gets up in his sleep and lights the lamp. The lamp explodes and sets fire to the house, which is totally destroyed. The house was insured for two-thirds of its value. Who should pay for the house?

A traveling man receives $100 expense money from his firm. He loses it. Should he repay it to the firm?

A boy has $1 which he received for the tickets which he sold for the school entertainment. A sudden freeze makes the skating good and he spends the money for a pair of skates, fully intending to replace the money from his earnings which he would receive for delivering papers, but fails to get the money for his teacher for the tickets. Was he wrong?

A bank cashier takes money from the bank for speculation and loses it. A wealthy friend makes good the loss, so that none of the depositors loses any money. Should the cashier be punished? Did the cashier do wrong? Whom did he wrong?

MAXIMS FOR MEMORIZING.

Honor is nobler than gold.

Honesty is the best policy.

Honesty is the poor man's pork and the rich man's pudding.

A good name is better than a good face.

A good name is rather to be chosen than great riches.—*Proverbs* xxii.

Worth makes the man, want of it the fellow.

A penny saved is a penny earned.

A penny saved is two pence clear.

I would rather be beaten in the right than succeed in the wrong.—*James A. Garfield.*

Never accuse others to excuse yourself.

A person good at making excuses is seldom good for anything else.

Write injuries in the dust; kindness in marble.

Be friendly and you will never want friends.

Keep good company and you shall be of the number.

Kindness is the golden chain by which society is bound together.

For whatever men say in their blindness
And spite of the fancies of youth,
There is nothing so kingly as kindness,
And nothing so royal as truth.

Habit is a cable. We weave a thread for it each day, and it becomes so strong that we cannot break it.—*Horace Mann.*

He liveth long who liveth well;
All else is life but flung away;

He liveth longest who can tell
Of true things truly done each day.

—*H. Bonar.*

Borrow neither time nor money of your neighbor; both are of equal value.—*Quarles.*

Truth crushed to earth shall rise again,
The eternal years of God are hers;
But Error, wounded, writhes in pain,
And dies among his worshipers.

—*Bryant.*

I count this thing to be grandly true,
That a noble deed is a step towards God,
Lifting the soul from the common sod
To purer air and a broader view.

—*Holland.*

So nigh to grandeur is our dust,
So near to God is man,
When duty whispers low, "Thou must,"
The youth replies, "I can."

—*Emerson.*

Little by little the world grows strong,
Fighting the battle of right and wrong;
Little by little the wrong gives way;
Little by little the right has sway;
Little by little all longing souls
Struggle up near the shining goals.

—*Anon.*

A common book will often give you much amusement, but it is only a noble book which will give you much profit. —*John Ruskin.*

Zoology

I. Definition.
II. Sub-Sciences.
  1. Systematic zoölogy.
  2. Distributional zoölogy.
  3. Animal morphology.
  4. Animal physiology.
  5. Ecologic zoölogy.
  6. Evolutionary zoölogy.
III. General Construction of Animals.
IV. Classification.
  1. Protozoa—One-celled animals.
    a. No definite shape; all forms; jelly-like substance; root-like projections of body for feet with which they seize their prey, and absorb it.
  2. Coelenterata—Many-celled.
    a. Simple organisms; capture food by long tentacles grouped around the mouth; no distinct circulatory system or body cavity; two types—free swimmers, shaped like a bell, and those cylindrical in form, fixed to some support.
    b. Examples: Sponge, anemone, coral, hydra, etc.
  3. Echinodermata.
    a. Sometimes called radiates. Consists of five parts around a center. Covering sometimes a hard shell; others, soft and leathery. Alimentary canal separate from body cavity.
    b. Three thousand living species found in all seas, such as starfish, sea urchin, crinoidea, etc.
  4. Vermes—Worms.
    a. Made up of joints or segments, head, tail, upper and lower surfaces, heart, nerves, etc.
    b. Many species, but all have same characteristics.
  5. Mollusca.
    a. Sometimes called shellfish. Possess alimentary canal, distinct nervous system, digestive apparatus, mouth, gullet, stomach, intestines; shell developed later in some.
    b. Examples: Oyster, clam, cuttlefish, etc.
  6. Arthropoda.
    a. Sometimes called articulates. Possess well organized nervous systems; usually have simple or compound eyes; some species are parasites.
    b. Examples: Insects, spiders, lobster, crab, etc.

7. Vertebrates.

a. Possess backbone; two cavities, upper containing brain, lower, heart, digestive organs, etc.

b. Examples: Mammals, reptiles, fishes, birds, amphibians, etc.

CORRELATED SUBJECTS:

Genus	Nautilus	Snail	Sea urchin
Species	Birds	Amphibians	Foraminifera
Variety	Animals	Crinoida	Jellyfish
Fishes	Reptiles	Amoeba	Polyp
Crustacea	Mammalia	Vorticella	Oyster
Clam	Arachnida	Myriapoda	Mollusca

QUESTIONS.

NOTE.—For additional questions on animal life refer to NATURE STUDY. In that department will also be found interesting outlines on ANIMALS, BIRDS, FISH, INSECTS, etc.

What is zoölogy?

What is the derivation of the term zoölogy?

What does cold-blooded signify when applied to animals?

What are the difficulties of classification in the case of the lowest form of animal life?

What are the causes of the migratory habit of animals?

Which is the more abundant, the higher or lower forms of life? Why?

What animal is born without a covering? Why?

What are the most useful animals to man for domestic purposes?

What animals supply food and clothing to man?

What animals are known as ruminants?

What parts of the deer are of commercial value? Where are they found?

How are flesh-eating animals equipped to eat their food? To obtain it? They are satisfied with one meal at a time, eaten rapidly; why?

Why does live stock have to graze so continuously?

What is the difference between an animal and a plant?

Name some of the many ways in which nature has provided for the safety and preservation of wild animals?

What animals produce the most expensive furs?

What do you mean by vertebrates?

In general, what one part of wild animals is of commercial value?

Name the domestic animals in what you think the order of their usefulness.

It is not the reading of many books which is necessary to make a man wise and good, but the well-reading of a few, could he be sure to have the best.

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